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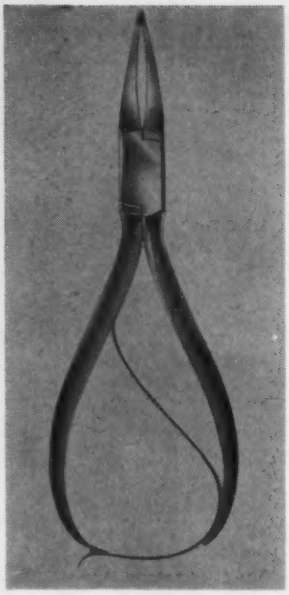

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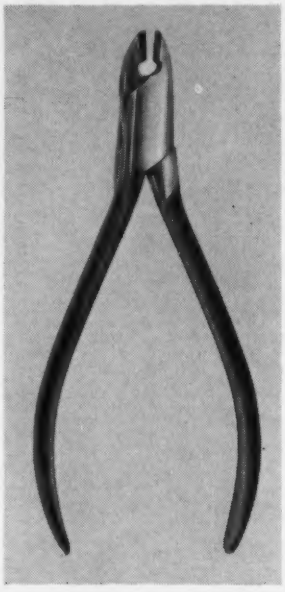

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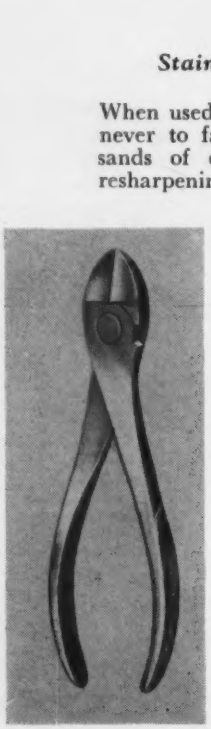

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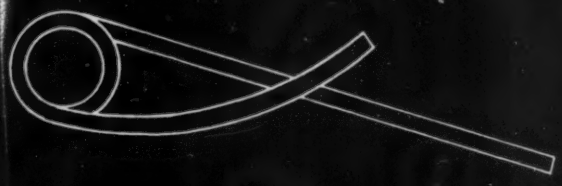

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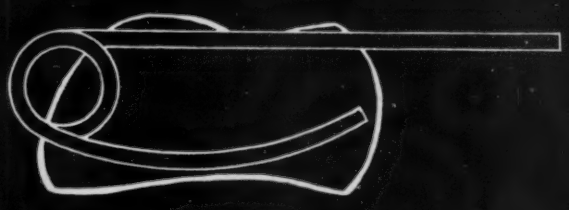

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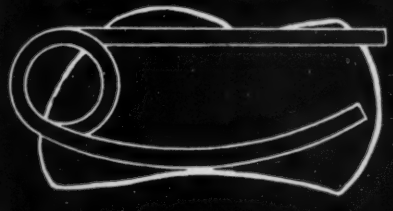

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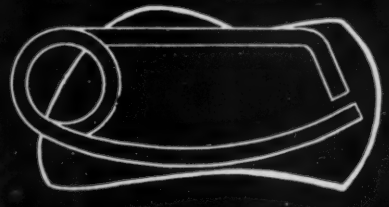

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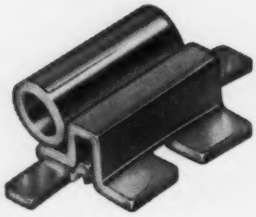

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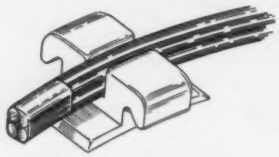

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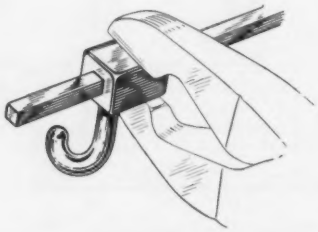

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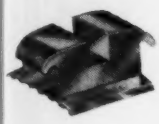

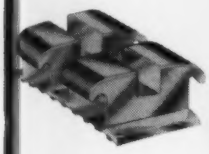

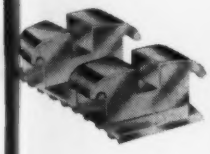

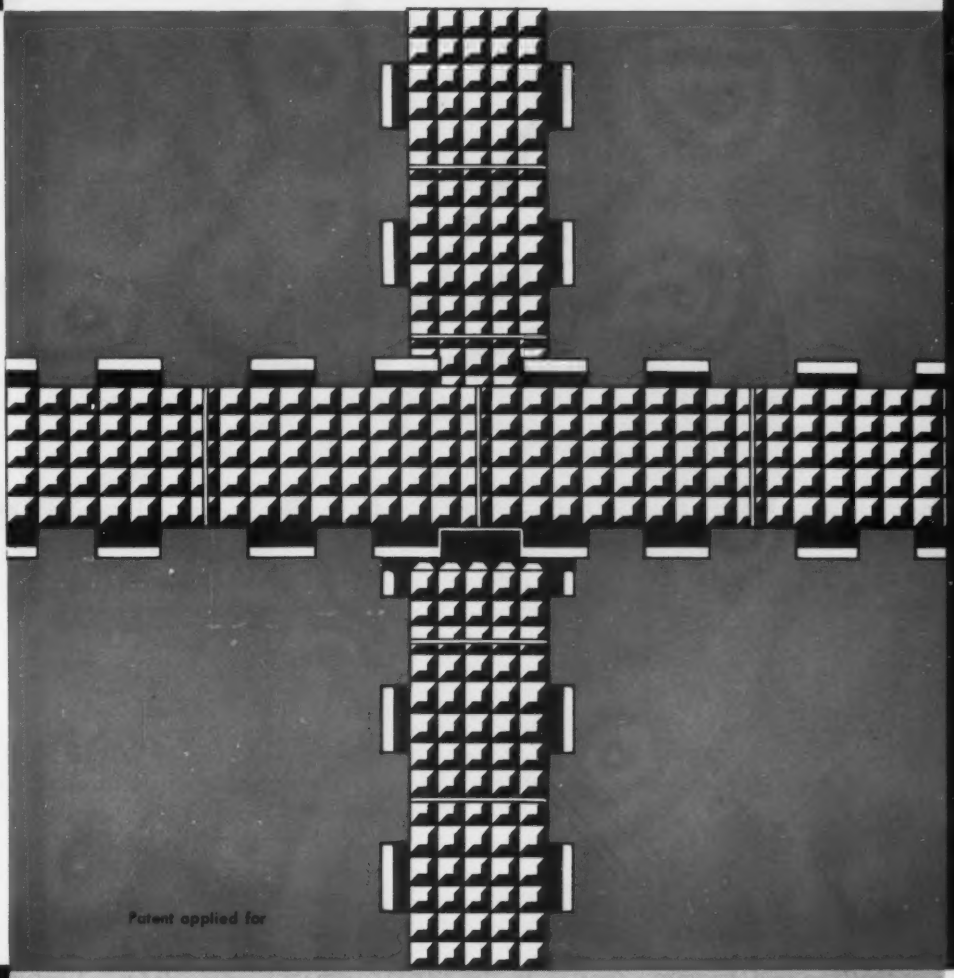

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VOL. 43 SEPTEMBER, 1957 No. 9

Original Articles

CORRECTIVE MEASURES DURING THE MIXED DENTITION

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> Today is not yesterday; we ourselves change; how can our Works and Thoughts, if they are always to be the fittest, continue always the same? Change, indeed, is painful; yet ever needful . . . .
>
> —*Thomas Carlyle* (1795-1881)

INTRODUCTION

THESE words of Carlyle are eminently appropriate to the applied sciences. In this area of man's knowledge change is the order of things and progress and change usually are synonymous. As new technological developments become known, application of the new technology is made and advancement of the various applied sciences continues. Consider, for example, in the applied sciences of dentistry and medicine how research in biochemistry and physiology has produced, in recent times, dramatic change and even more dramatic progress in the methods of preventing dental caries and poliomyelitis.

Changes in orthodontic treatment techniques are an inseparable part of the progress that has been made in clinical orthodontics. Often these new techniques are born of new concepts and are the product of advances made in the knowledge of the etiology, diagnosis, and prognosis of malocclusion. Sometimes new applications are found for old techniques.

The profession's attitude toward treatment during the mixed dentition period is an illustration of the change that accompanies progress.

Presented at the annual meeting of the Florida Orthodontic Society, Tampa, Florida, March 4, 1957, and the fifty-third annual session of the American Association of Orthodontists at New Orleans, Louisiana, May 14, 1957.

Mixed dentition treatment in the past quarter century has alternately been in favor, out of favor, and back in favor again with the orthodontic fraternity. Currently it enjoys more widespread acceptance than it did at any prior time, but this position has been gained only through considerable metamorphosis.

HISTORY

In 1933, C. R. Baker[1] strongly advocated treatment during the mixed dentition period. He felt that this was the best stage at which to effect orthodontic correction. It was his policy to advise treatment just after the permanent incisors erupted if these teeth were rotated. Increases in arch width, if needed, were to be acquired in the mixed dentition stage. Anteroposterior malrelations of posterior teeth were to be corrected in this period. All cross-bites were deemed to be indications for immediate treatment.

In the same year S. J. Lewis,[2] writing of the proper time to begin orthodontic treatment, observed that in the mixed dentition changes are occurring so rapidly that some conditions are assumed to be abnormal but are only representative of normal developmental variations. He recommended that the apparent abnormality be observed for a period of time and, if normal adjustment does not take place or the condition becomes worse, then and only then treatment should be instituted.

In the period encompassing the mid-thirties to the mid-forties, one can detect the constraint that orthodontic writers were using to avoid recommending anything but minimal treatment in the mixed dentition period.

This era of pessimism at least was nurtured by, if not born of, the findings of roentgenographic cephalometry. Here for the first time, with the introduction and use of the Broadbent-Bolton cephalometer, the clinician was able to evaluate critically the results of his orthodontic therapy. The zone of appliance influence was discovered to be a discouragingly narrow one, confined to the teeth and their supporting alveolar processes. Brodie's[3] conclusion from his cephalometric appraisal of orthodontic results that an undesirable basic facial pattern cannot be changed by orthodontic means to an harmonious one, because the craniofacial pattern is established at birth and changes but little thereafter, served to deepen orthodontic pessimism regarding the merit of mixed dentition treatment.

Additional reasons for not attempting treatment in the mixed dentition period were found in the report of Goldstein and Myer,[4] published in 1940. Their cephalometric study of a group of Class II, Division 1 cases treated in the mixed dentition revealed the inadequacy of the mandibular arch to provide anchorage for the use of intermaxillary elastics.

Some of the pessimism was lifted in the late forties, however, because in 1947 Kloehn[5] expressed the opinion that the inadequacies of mixed dentition anchorage could be overcome if greater use were made of extraoral anchorage. He recommended treatment of some Class II, Division 1 malocclusions and Class I cases with protruding maxillary incisors during the mixed dentition period. He exerted no force on the mandibular dental arch and, therefore,

ran no risk of disturbing the acceptable positions of the mandibular teeth. Using extraoral anchorage and suitable intraoral appliances on the maxillary denture, he moved the maxillary teeth distally, while the upper face and the mandible were allowed to grow in a normal downward and forward direction. Kloehn called this treatment "guiding growth of the alveolar process and eruption of the teeth." He recommended that it be started just as soon as the first permanent molars have fully erupted because of the declining rate of growth of the jaws and alveolar processes.

Possibly Kloehn and others were influenced to attempt treatment with extraoral forces by a paper which Oppenheim[6] published in 1944. In writing about the possibilities of moving teeth he said:

> The head cap was rediscovered by the author, who rescued it from the oblivion into which it had fallen for decades. The author's only merit in its renewed and now widespread use is that he showed its usefulness for mass movement of teeth by applying force only to one tooth (molar). This happens by the transmission of force through the transseptal fibers from tooth to tooth as long as the force applied is not so strong as to overstretch or sever these fibers. In this instance, the force acts only on the one tooth to which it is applied, and the gap between it and the neighbor tooth becomes gradually greater and greater. The use of a head cap as suggested by the author was not an intuition but the result of a lucky chance. An actress with greatly protruding teeth, a Class II case with the chin in normal position (upper protraction) came to his office. The upper teeth needed to be brought back. The whole upper complement of teeth was present. The use of the head cap was suggested so as not to interfere with her professional duties. The suggestion was accepted. The patient came to the office several times at short intervals complaining about soreness of the teeth, impossibility of chewing, and sleeplessness from pain. Each time the force was diminished, and then she did not appear again. Believing that she was loath to continue treatment, the author was astonished when she reappeared several months later; and what had happened? The teeth had ceased to be sore so she had conscientiously worn the head cap during the months of her starring performances all over Europe. On her return, all the buccal teeth, formerly in Class II relationship, were now in end-to-end bite with no spaces between them except between the first premolars and canines. Treatment was continued with new rubbers (the original pair of rubbers having been worn all the months through) 'til normal interdigitation was obtained. Thus, a new way for the use of the head cap had been found; previously it was recommended and used only for reinforcing anchorage.

In a well-written and well-documented paper, Hays Nance[7] in 1947 recommended orthodontic treatment for the mixed dentition malocclusion only if it fell into one of three categories: (1) a cross-bite (anterior or posterior), (2) a Class III malocclusion, or (3) an extreme Class II malocclusion. Nance condemned any attempt to increase arch length by expansion procedures or by moving molar teeth posteriorly. He found that only a limited amount of arch expansion could be obtained and maintained; also that posterior movement of molars was possible only if they had tipped forward from their normal positions. He did feel that crowded permanent mandibular incisor teeth in the mixed dentition might be helped by extracting the deciduous canines early, but recommended this procedure only if the combined mesiodistal widths of the crowns of deciduous canines and molars exceeded that of their permanent

successors by at least 1.7 mm. on each side. He advised the use of a preventive lingual arch wire in these cases to maintain existing relationships between the permanent incisors and the permanent first molars while prematurely extracting the deciduous canines and molars.

In this same era Salzmann,[8] writing on the time to begin treatment, said: "Orthodontic therapy . . . should be undertaken as soon as it is recognized that a condition exists which interferes with normal growth, development, function, or relationship of the teeth and dental arches and there is little possibility of correction by further growth or developmental processes alone. . . . It should be remembered that there is generally greater danger in 'too much, too soon,' rather than in 'too little too late.'"

Strang[9] expressed the opinion that treatment in the mixed dentition should be avoided except in cases that exhibit faulty relationship of arches to each other or to cranial anatomy. He believed that this period should be used to train abnormal-acting musculature and attempt to eliminate all etiological factors so that natural correction of the malocclusion might occur if possible.

In 1948, G. A. Dinham[10] commented thus on mixed dentition treatment: "... to the best of my knowledge no one has shown proof that a high percentage of cases treated in the mixed dentition have been so successful as to require little or no treatment of the permanent denture. Yet we all can show a large number of cases so treated which are unsatisfactory and which do require extensive retreatment. Until someone presents a significant series of cases treated in the mixed dentition stage in which results are so satisfactory as to justify treatment at this stage, the inference must be that, although some improvement in gross abnormalities is possible, as in Class I cases with Class III tooth relationships, much more proof is necessary before treatment in many mixed dentitions can be considered good procedure."

The difference of opinion on the merits of mixed dentition treatment found frequent expression in the literature and was stated by many clinicians at orthodontic meetings. Typical of the dissimilar viewpoints held by various orthodontists were the statements made on two panel programs that had mixed dentition treatment as their theme. At the 1949 meeting of the E. H. Angle Society, Hahn,[11] the moderator, speaking on "Treatment of Malocclusion in the Mixed Dentition," observed that in the last fifteen years a great diversity of opinion had developed about mixed dentition treatment. He felt that this difference of opinion could be traced in part to the cephalometric findings on growth and development, that is, basic pattern of growth of the face and jaws is laid down very early and, once established, is not subject to change by orthodontic movement of the teeth.

Kloehn,[12] one of the panelists, felt that good environmental forces are necessary for a good stable result. These forces can be developed into better balance by correction of malocclusion at an early age when the major development and growth of the face are to follow. Alveolar bone growth is influenced

by environmental forces surrounding it, thereby guiding its growth and development. Kloehn believed that failures in mixed dentition treatment could be eliminated by better analysis and better application of mechanical forces.

Bishop[13] advocated little treatment during this period because he observed that growth studies have conclusively shown that there is "no appreciable growth of skeletal bone in the tooth bearing areas of the mandible or maxilla during this transitional period which will make room for the teeth."

Kelly[14] recommended orthodontic correction for a variety of conditions. He advised these treatment procedures in the mixed dentition: (1) serial extraction in the mixed dentition; (2) correction of cross-bites; (3) use of bite blocks, bite planes, lingual arches, and headcaps for minor tooth movements or short treatment periods; and (4) reduction of maxillary incisor protrusion in severe cases to lessen the possibility of fracture of these teeth.

Terwilliger[15] felt that: (1) all cross-bites (anterior as well as posterior) should be treated as early as possible; (2) crowded conditions that result from lack of development due to external pressures should be treated if the pressures can be relieved; and (3) cases of insufficient arch length due to forward drift of molars that is due to premature loss of primary teeth should be treated because it is "a simple matter to restore these drifted teeth to their normal positions and retain them there throughout the shedding period."

Insufficient arch length cases that are due to "the discrepancy between tooth pattern and the amount of bone available" require early treatment.

Lasher[16] recommended minimal treatment during the mixed dentition. He felt that only Class III and pseudo Class III cases should be treated in the mixed dentition. Class I cases with their typically narrow arches are handled by Lasher with lower deciduous canine extractions and a prophylactic retainer in the upper and lower arches. This is done to hold the teeth as they are and is the only treatment given at this time.

Class II cases are treated similarly except that if a psychological problem exists, or if a traumatic overbite is present, a retainer is placed in the upper arch to close the spaces between the upper anterior teeth and a bite plane is inserted to remove the marked overbite.

The second panel discussion on mixed dentition treatment was part of the program of the 1954 meeting of the American Association of Orthodontists.

Kloehn,[17] a generous contributor to the literature on the subject of mixed dentition treatment, recommended that "treatment be started as early as any factors and forces are recognized which will inhibit growth and development." Hahn[18] advised treatment in the deciduous dentition of anterior or posterior cross-bites, extreme Class II, Division 1 malocclusions, bimaxillary constrictions, and all Class III malocclusions, "provided that the fontanels have closed." Terry[19] felt that treatment should be started as early as possible in any case that had correctable factors which, if allowed to remain, would continue to affect the case adversely.

My viewpoint on the value of mixed dentition treatment has been altered several times during the past twenty-five years. From the opinion held in the

1930's, that almost all types of malocclusion could be treated to the patient's as well as the operator's advantage, an opinion which led to the treatment of all Class II, Division 1 malocclusions and many Class I cases with deficient arch length, my belief changed to one of dark pessimism regarding what could be accomplished in the mixed dentition period. Bitter experience demonstrated the folly of trying to increase arch length. Case after case treated in the mixed dentition period had to be retreated after all the permanent teeth had erupted. Class II, Division 1 malocclusions were reduced using intermaxillary forces, and the results were most unsatisfactory when the mandibular dental arch was critically examined. Many of these cases, at the start of their mixed dentition Class II correction, had a well-formed mandibular dental arch with teeth upright and no evidence of crowded or rotated teeth. Almost all of these same cases ultimately demonstrated the fact that the mandibular arch had yielded under the intermaxillary forces used during treatment. The mandibular teeth were tipped labially, contacts slipped, teeth overlapped, and anterior teeth began to rotate.

The long-range results of expanding arches during mixed dentition treatment in an effort to increase arch length were no less discouraging. These untoward clinical experiences were duplicated in the practices of other orthodontists and confirmed by cephalometric roentgenography as well as by clinical observation. Brodie, Goldstein, and Myer,[20] in a cephalometric appraisal of Class II, Division 1 cases, showed that the mandibular arch gives away under the action of intermaxillary Class II elastic force, while the maxillary arch remains relatively stable.

Nance[7] demonstrated clinically the futility of attempting to increase arch length in the mandibular dental arch with mixed dentition treatment.

With our own clinical experience and the weight of cephalometric evidence plus the testimony of capable clinical orthodontists all pointing to one conclusion, I was persuaded that only a minimum amount of permanent benefit would accrue to patients who were treated in the mixed dentition period.

However, in the late 1940's this pessimism regarding the benefits of mixed dentition treatment was shaken with respect to the management of Class II, Division 1 malocclusions when Kloehn[5] and others demonstrated the effectiveness of extraoral anchorage in mixed dentition mechanotherapy. Applying this anchorage as well as using a more careful analysis of mixed dentition cases by following the diagnostic principles recommended by Nance[7] resulted in a higher percentage of successfully treated mixed dentition malocclusions. At present, it is my opinion that many types of malocclusions may be treated to the patient's advantage in the mixed dentition period. Appliances are a part of the therapy recommended in treating the following conditions. All are indications for mixed dentition treatment.

I. Class III malocclusions (pseudo and true).
II. Anterior and/or posterior cross-bites.
III. Complete buccoversion or complete linguoversion of permanent molars.

IV. Class I malocclusions characterized by marked protrusion of maxillary incisors with or without a deep vertical overbite, provided that the mandibular arch is well developed, provided that there is space between the labially prominent incisors which will permit their lingual tipping, and provided that extraoral anchorage is used exclusively.

V. Class II, Division 1 malocclusions characterized by a well-developed mandibular dental arch and with spaces between the labially prominent incisors which will permit their lingual tipping, provided that extraoral anchorage is used exclusively.

VI. Cleft palate malocclusions.

VII. Malocclusions caused by perverted oral habits, that is, perverted sucking or swallowing habits.

VIII. Ectopia of one or more teeth that will not be self-correcting.

IX. Premature loss of deciduous molars whenever observation reveals a tendency on the part of the first permanent molars to shift forward a distance in excess of the "leeway."

The first three types of malocclusions (Class III's, anterior and/or posterior cross-bites, and complete buccal or linguoversion of permanent molars) have been considered indications for immediate treatment by practically everyone who has written on the subject of mixed dentition treatment. Indeed, most orthodontists would even prefer to treat anterior or posterior cross-bites (if they have developed) at an earlier date, that is, during the deciduous dentition period. The reason that there is such a unanimity of opinion regarding the desirability of treating these malocclusions the first time they are detected is that experience has taught that these conditions are rarely self-correcting and there is an almost certain tendency for them to become more severe types of malocclusion with the passage of time. There is, therefore, nothing of a beneficial character to be gained by delaying the start of treatment for these types of malocclusions, while the most favorable outcome of treatment may be placed in some jeopardy by waiting to initiate the correction (Figs. 1 and 2).

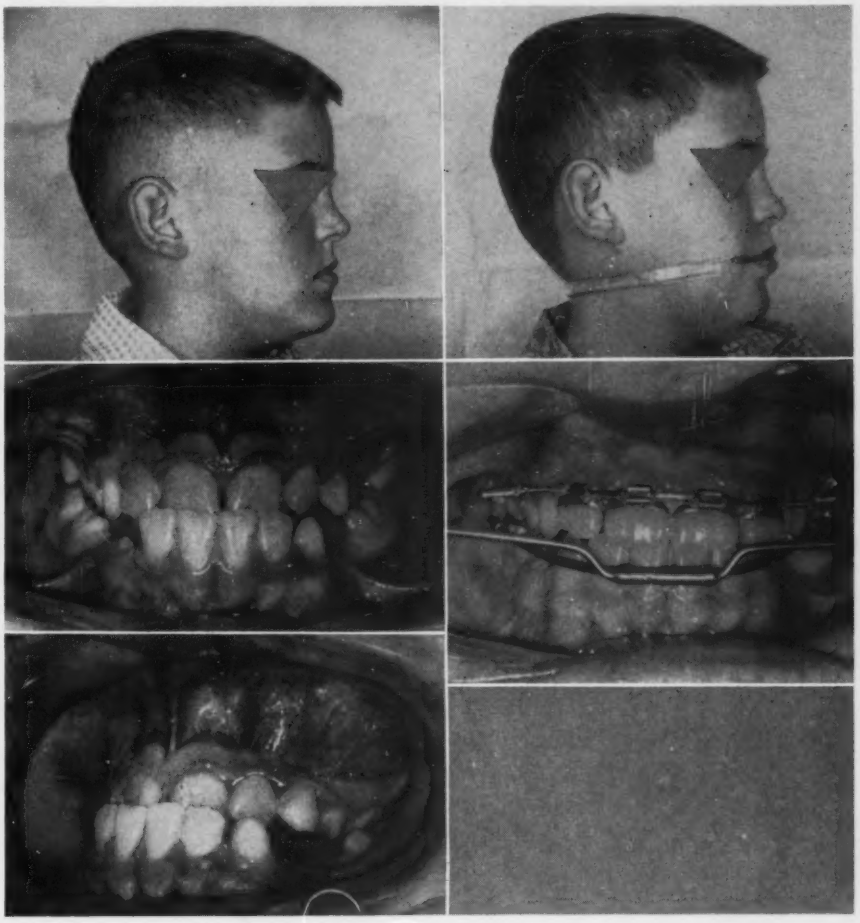
The fourth and fifth types of malocclusions listed as indications for treatment in the period of the mixed dentition include Class I and Class II malocclusions which have these features in common: (a) protrusion of maxillary incisors; (b) diastemata between the labially prominent incisors; and (c) a well-developed mandibular dental arch with adequate space to accommodate all the lower teeth in good axial relationships and in nonrotated positions.

Class I or Class II malocclusions with these characteristics are amenable to treatment in the mixed dentition period and are ideal indications for the mechanotherapy that employs extraoral anchorage.

The advantage of using extraoral forces in treating malocclusions with these characteristics is that the ideal relationship of the mandibular teeth to their bony base is not disturbed by subjecting them to intermaxillary force (Fig. 3).

Fig. 1.—*A*, Frontal and right lateral views of a cross-bite malocclusion in the mixed dentition that involves all the teeth on the right side from the deciduous canines posteriorly to and including the first permanent molars. *B*, Cross-bite corrected and treatment discontinued. Note the improvement in the midline relationships of the maxillary and mandibular dentures. *C*, Benefits of treatment being maintained without retention. *D*, Stability of the treatment result is demonstrated in the appearance of the case ten years after treatment was discontinued.

Beulah Nelson,[21] commenting on the advantages of intermittent force as employed when occipital or extraoral anchorage is used ten hours nightly in place of full-time intermaxillary anchorage, observed: "(1) It is an effective, practically painless method of moving teeth. (2) A minimum of banding and appliance can be used . . . . (3) The problem of retention is diminished by tapering off the wearing of the appliance. (4) Clinically the soft tissues of the mouth look healthy and free of inflammation. (5) There is no x-ray evidence of damage to the roots or alveolar bone."



A. *B.*

Fig. 2.—*A*, Profile view of patient with a Class III malocclusion in the mixed dentition. Frontal and left lateral views of the teeth reveal the anterior and posterior cross-bite relationships which accompany the Class III malocclusion. B, Extraoral force, through the medium of the cervical gear, is being directed against the mandibular teeth while the maxillary incisors are being tipped labially.

When occipital anchorage is used to correct Class II, Division 1 malocclusions, Urban[22] believes that the factors which may be considered to contribute to the improvement in the denture and facial profile are: (1) distal movement of upper teeth; (2) forward adjustment of the mandible; and (3) mandibular growth.

Fig. 3.—*a*, Frontal views of a series of casts of a Class II, Division 1 malocclusion treated in the mixed dentition. Extraoral anchorage was used exclusively. Cast *A* shows the condition at age 9 years when treatment was started. Cast *B* represents the progress of one year's treatment. Cast *C* shows condition at the end of retention. Cast *D* represents the case two years out of retention. *b*, Left lateral views of the casts. *c*, Right lateral views of the casts. *d*, Occlusal views of the casts. Observe that the positions of the mandibular anterior teeth have not been disturbed by treatment. Since extraoral forces alone were used, no intermaxillary forces were applied against the mandibular arch.

The indications for extraoral therapy, according to Graber,[23] are: (1) mandibular denture acceptable as to arch form, contact relationship, individual tooth positions, curve of Spee, and basal bone relationship and (2) protrusion of maxillary incisors with spacing between all or some of the maxillary anterior teeth (Figs. 4 and 5).

The desirability of using extraoral therapy stems from the consideration that "prolonged Class II therapy against the mandibular arch either tips the lower teeth forward or slides them forward on the base, regardless of the type of appliance."

Matthews[24] reported on a series of more than fifty children with Class II (Angle) malocclusions who were treated from the late deciduous through the early permanent dentitions. Multiple banding of maxillary teeth and edgewise appliance with occipital anchorage were used except in a few patients with severe open-bites, where cervical traction was employed. An effort was made to minimize distal tipping of posterior teeth and lingual torquing on anterior teeth. Close-bites were corrected during the stage of retention with a bite plate as part of the Hawley retainer that was used.

Graber,[23] reporting on a group of 150 Class II, Division 1 cases, observed that there were three factors to consider in assessing these types of malocclusions: (1) basal relationships, (2) overbite, and (3) overjet.

"Overbite correction with or without bite plate assistance remains one of the most difficult treatment objectives, using extraoral force alone. Probably the lack of control over the curve of Spee is a major factor here, over and above the morphogenetic pattern." Graber does not believe that extraoral therapy has the ability to withhold maxillary growth; he does feel that maxillary alveolar growth can be influenced and that there is evidence that bodily distal movement of first molars is possible.

"In most cases the maxillary first molar is merely restrained from coming forward in its normal path or tipped distally." Distal tipping of maxillary first molars is one of the shortcomings of extraoral therapy. This may be surmounted by waiting until second molars erupt, by removal of second molars, or by using second deciduous molars instead of first molars as anchor teeth. Tipping is minimized by bending the outer bow to parallel the direction of cervical traction, using a headgear and occipital force in place of cervical traction, or multiple banding of maxillary teeth.

Graber[23] lists the limitations of extraoral appliances as "strong dependence on patient cooperation, intermittent wearing, all-too-frequent unilateral response, inability to eliminate excessive curve of Spee in many cases, tendency for maxillary molars to tip excessively distal, sometimes impacting second molars, and excessive lingual inclination of maxillary incisors in some cases." He recommends extraoral therapy for cases in which the major problem is an apical base dysplasia. He does not feel that we can make the mandible grow, but he feels that we can take advantage of growth. If the maxilla and mandible grow downward and forward at the same rate, "Why not," he asks, "consider restricting maxillary growth or, at the very least, maxillary alveolar growth?"

Occlusal views of the casts. Observe that the positions of the mandibular anterior teeth have not been disturbed by treatment. Since extraoral forces alone were used, no intermaxillary forces were applied against the mandibular arch.

A. *B.*

Fig. 4.—*A*, Class II, Division 1 malocclusion in the mixed dentition. Extraoral therapy was used. *B*, Progress of treatment in ten months.

Cleft palate malocclusions composed the sixth category that was listed as an indication for instituting mechanotherapeutic procedures in the period of mixed dentition.

Unilateral or bilateral clefts that involve the hard palate and the alveolar ridge will almost invariably need orthodontic assistance to give the maxillary dental arch its proper form and to correct the positions of the individual maxillary permanent teeth that erupt in malposition.

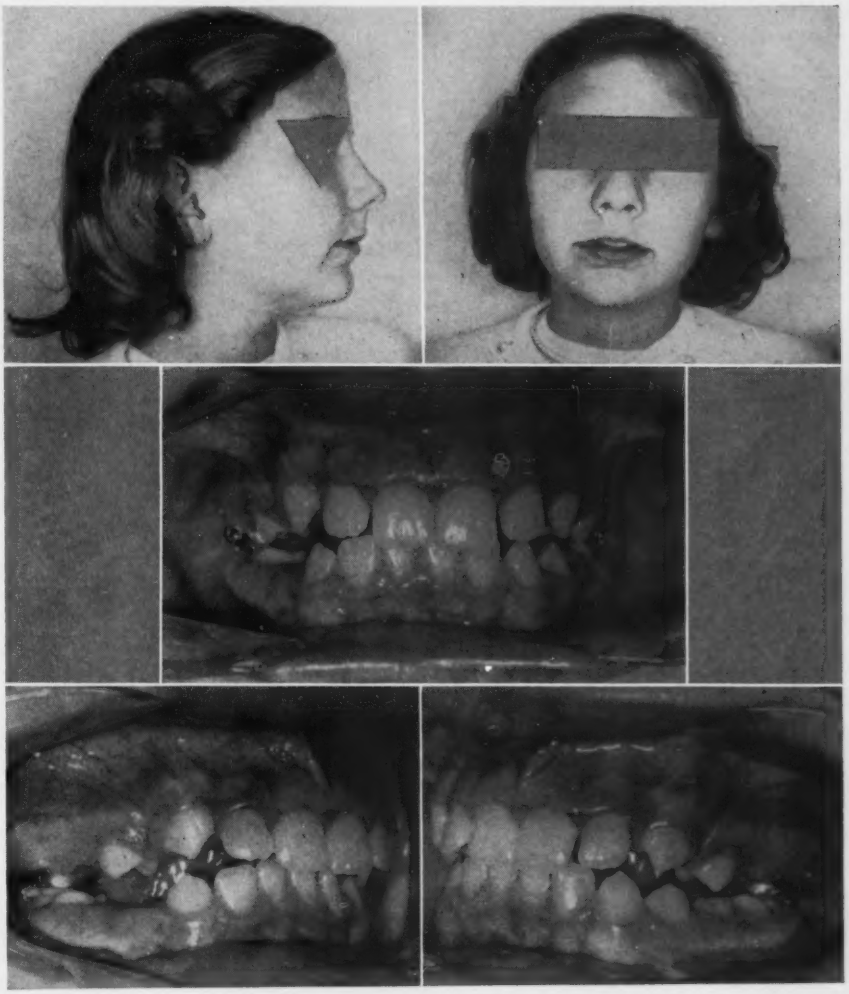


Fig. 4.—*C*, After twenty months of treatment. No appliances have been used on the mandibular denture; one is now indicated to shift mandibular midline to the right.

The anterior ends of the lateral segments of the maxillary dental arch, on the side of the cleft, have a strong tendency to rotate toward the midline, and this is followed by a lingual collapse of the premaxillary process. Needless to say, this collapse of the lateral and anterior sections of the alveolar ridges of the maxilla carries the associated maxillary teeth with it; buccal as well as anterior cross-bites are thus established. These undesirable changes occur

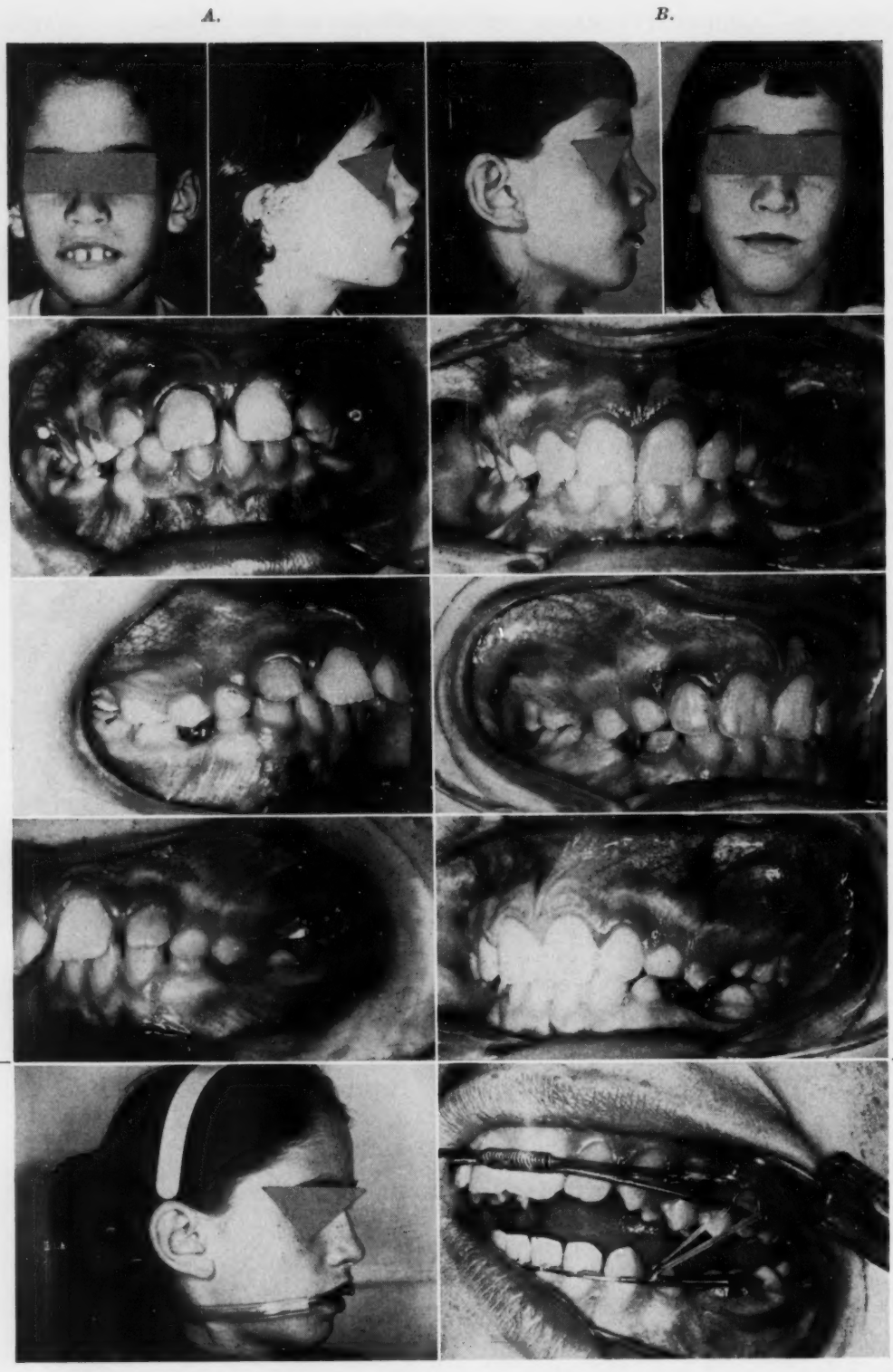
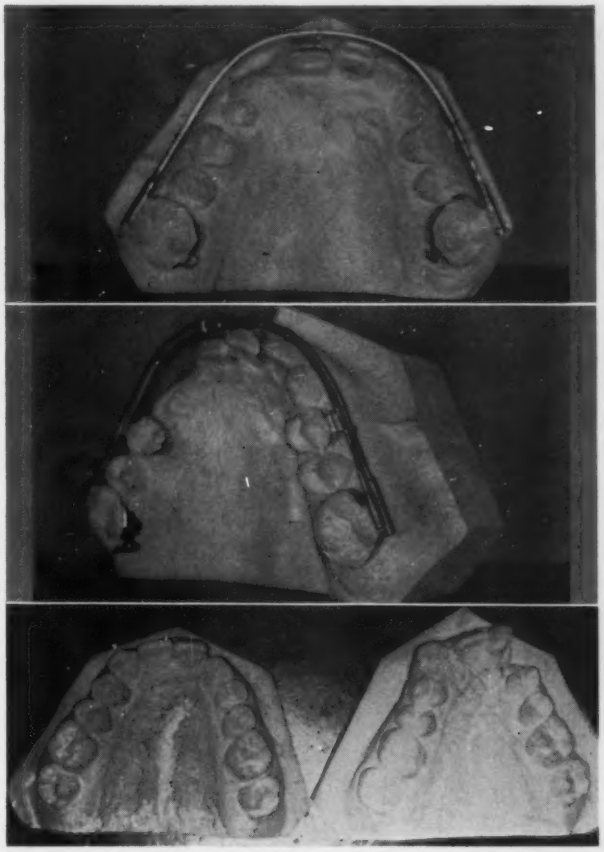


Fig. 5.—*A*, Class I maocclusion in the mixed dentition. Extraoral therapy was used. Note the deep vertical incisor overbite. *B*, After twenty-two months of extraoral therapy. Vertical overbite and horizontal overjet improved. *C*, Extraoral appliance in the form of a cervical headgear being used to maintain positions of maxillary teeth while a "tandem hook-up" as suggested by Jay, is employed to open space for the unerupted mandibular left second premolar.

almost without exception when the reparative surgery on the tissues of the hard palate is instituted before width growth of the palate is complete, but it should not be assumed that the collapse of the maxillary dental arch form is



A.

B.

C.

Fig. 6.—*A*, The type of appliance used for fixation after the maxillae have been surgically disarticulated to permit buccal positioning of the collapsed lateral segments of the maxillae. *B*, Another view of the same appliance showing the double buccal tubes soldered to the molar bands. A double labial arch wire fabricated from .050 and .036 inch wire fits into the tubes of comparable sizes on the molar bands. The double arch wire gives added strength to the fixation appliance and also prevents the buccolingual tipping of the molar teeth. *C*, A collapsed maxillary dental arch that was improved by orthodontic therapy and surgical disarticulation of the right and left maxillae. (Courtesy of Dr. Ralph E. Braden.)

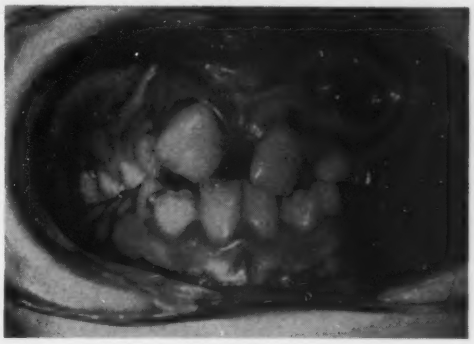


Fig. 7.—The typical rotation and axial malrelationship of maxillary central incisors present in the patient with a cleft that involves the alveolar ridge. Displacement of the central incisors is comparatively mild in this case.

caused solely by poorly timed plastic repair, because it can be shown that similar collapse may also occur in the cleft palate patient not operated upon.

The advantage of instituting orthodontic treatment for these cases in the mixed dentition period is that extremely collapsed anterior and lateral segments of the maxilla may be repositioned with most gratifying results in an unusually short period of time. This is accomplished by a process of expansion, but expansion in these cases is entirely different from expansion of the dental arch in a noncleft case. Here the arch widening and arch lengthening are accomplished not by tipping teeth to the labial or buccal, but rather by moving, in a bodily manner, whole segments of the alveolar process and their attached teeth to the labial or buccal. This, then, is a segmental movement that distinguishes it from the typical expansion movement.

Of course, once these arch segments are properly positioned, it is mandatory that they be supported against their tendency to collapse lingually. Retention is an immediate and permanent necessity. A fixed-type retaining appliance is preferred.

In those cases where early surgery on the palatal areas has produced scarring which makes buccal positioning of the collapsed lateral segments of the maxillae impossible, Braden and Adams[25] of the Memphis Cleft Palate and Cleft Lip Clinic group have devised a combined surgical and orthodontic technique which makes these cases easier to manage. One or both maxillae, as the case may require, are surgically disarticulated, placed in their most ideal relations, and then stabilized in these positions by an orthodontic appliance that is inserted at the time of the surgery. The appliance is constructed on a maxillary cast which is sectioned so that the teeth and alveolar portions of the cast can simulate the conditions that are to prevail when surgical separation is effected. Upon this cast the teeth and the alveolar processes of the maxillae are moved so as to establish satisfactory occlusal relations with the teeth on the mandibular cast. The orthodontic fixation appliance that is to be inserted immediately following the surgery is fabricated upon such a maxillary cast (Fig. 6).

In the cleft palate case, individual permanent teeth, especially maxillary incisors, almost always require some orthodontic assistance. These teeth have a tendency to erupt in torsiversion, with faulty axial relationships, in linguoversion, and short of the normal occlusal plane (Fig. 7). Since self-correction cannot be anticipated, the functional and cosmetic needs of the patient are best served by starting treatment early.

The seventh indication listed for orthodontic treatment during the mixed dentition period included those malocclusions that are caused by perverted oral habits, such as perverted sucking or swallowing habits. The recommendation given here is that the malocclusion be treated by controlling or eliminating the cause of it. Perverted sucking habits are amenable to appliance therapy. In our experience, an intraoral appliance will succeed in causing discontinuance

of the sucking habit when all other approaches have failed. Success in eliminating perverted swallowing has been less noteworthy. The reason for advising early interruption of these habit patterns is that they are easier to control when they have not been practiced so long and become firmly entrenched.

The eighth indication for a mechanotherapeutic approach to malocclusion in the mixed dentition includes those cases in which ectopic eruption of a tooth (usually an incisor or first molar) creates a situation which has no chance of

Fig. 8.

Fig. 9.

Fig. 10.

A. *B.*

Fig. 8.—*A*, Ectopically erupting maxillary left central incisor. Space for the unerupted maxillary right central incisor is inadequate. Immediate treatment is indicated. *B*, Same case showing the cross-bite malocclusion involving all the teeth on the right side from the canine to the first permanent molar. (An additional reason for indicating immediate treatment.)

Fig. 9.—*A*, An ectopically erupting maxillary left central incisor. The pressure of an adjacent supernumerary tooth was the etiological agent involved. *B*, Appearance of the case following extraction of the supernumerary tooth and orthodontic treatment.

Fig. 10.—*A*, Severe ectopia of the mandibular left lateral incisor. *B*, The malpositioned mandibular lateral incisor can be treated if correction is in progress before the mandibular left canine begins to erupt.

self-correction, is easily treated in its early manifestation, and is destined to become more complicated by involving other teeth if left untreated until a later time (Fig. 8). Maxillary incisor teeth that are the victims of the pressure of supernumerary teeth frequently are forced to erupt in torsiversion (Fig. 9). Often the ectopia will involve only a single tooth. It is a simple matter to make orthodontic correction early before adjacent teeth become malposed as a result of the ectopically erupted incisor.

Mandibular lateral incisors occasionally erupt distal and lingual to their normal positions. As such, these teeth may present an erupting incisal edge lingual to the first deciduous molar. Cases of this type can be treated successfully and with a minimum expenditure of time and effort if treatment is instituted promptly. Indeed, such cases are not amenable to orthodontic correction if treatment is not well under way before the mandibular permanent canine begins to erupt (Fig. 10).

Severe manifestations of ectopia involving first permanent molars are not an uncommon phenomenon. If the condition is to be handled properly, the premature removal of a second deciduous molar is required to permit the total eruption of the first molar. Invariably this results in a first molar that has erupted in such extreme mesioversion as to have taken a large part of the space that will subsequently be needed for the eruption of the second premolar. This, in turn, demands that a choice between two conditions be made: either (1) a premolar in that quadrant of the dentition must be sacrificed and the molar allowed to move forward the entire width of a tooth or (2) simple mechanical treatment procedures must be employed to tip the molar distally enough to place it in Class I relationship and open space for the premolar. The latter choice is often a more desirable one than the former.

The ninth and last of the conditions that are listed as indications for treatment in the mixed dentition, the management of which involves appliances, is the potential malocclusion that accompanies premature loss of primary molars. Space-maintaining devices have a place in mixed dentition orthodontic therapy. Obviously, they will be more urgently needed in some denture areas than in others, more urgently needed in some patients than in others, and completely unnecessary and perhaps even undesirable in other cases.

The manifest discrepancy case, where tooth size is in excess of bony base, is not one in which space maintenance will be indicated. Neither will it be so much of a problem in the case where the development of the basal arches is patently in excess of the dental arches, because active orthodontic treatment will be necessary in both instances: in the former case to be involved with extracting some permanent teeth and closing spaces and in the latter case closing spaces without removal of teeth.

The problem case, the one that is not so clearly an indication or a contraindication for space maintenance, is the one which will require more study.

Decisions on these cases should be made only after measuring the space available from the first permanent molar on one side to the first permanent molar on the opposite side, and comparing this with the space needed by the

unerupted permanent teeth as well as that which may be required to reposition the permanent teeth that are already erupted, if their positions are not acceptable. If a deficiency in the space available compared to that which is needed is revealed, space maintenance would be ill-advised. If the space available is in excess of the space the permanent teeth will need by the minimum "leeway" designated by Nance,[7] or more, space maintenance may be a wise and useful procedure.

There are two techniques that are generally applied in determining the size of the unerupted permanent teeth: either the teeth may be measured from dental roentgenograms or various predictive formulas may be used. Both techniques have their shortcomings but, if applied with reason, can supply useful diagnostic information. Computation of the available space from first molar to first molar is most accurately accomplished on dental casts, using brass ligature wire to measure arch length and employing the technique suggested by Nance.[7]

Mixed dentition orthodontic treatment is not always mechanotherapy. Appliances are not a part of the therapy recommended in the following:

I. Extraction of supernumerary teeth at the earliest feasible time.
II. Surgical exposure of permanent teeth that are delayed in erupting.
III. Serial premature extraction of mandibular deciduous teeth.
IV. Serial extraction of deciduous and permanent teeth.

Extraction of supernumerary teeth is the first therapeutic measure recommended that is not involved with orthodontic mechanotherapy. Supernumerary or extra teeth frequently are found in the midline region of the maxillary denture. In this or any other region of the maxillary or mandibular denture, they are the cause of various types of dentofacial abnormalities. Their presence may be the cause of malocclusions characterized by impaction, midline diastemata, ectopic eruption, or crowding of permanent teeth.

When supernumerary teeth are present in the maxillary incisor area, a typical anomaly ensues—that is, one or more of the permanent incisors usually are impacted. The common clinical picture is that the patient fails to exfoliate a deciduous central incisor at the expected time. The adjacent deciduous incisors are shed and their succedaneous teeth erupt on schedule. Roentgenographic exploration of the region superior to the retained deciduous incisor usually will disclose the presence of one or more supernumerary teeth. Treatment consists of prompt removal of the extra tooth or teeth. Their extraction generally is followed by uneventful eruption of the impacted permanent incisors.

The second nonmechanical treatment procedure recommended in the mixed dentition period is the surgical exposure of late-erupting permanent teeth. In those instances where tardy eruption of permanent teeth cannot be accounted for by the ankylosis of primary teeth, the retention of deciduous teeth, the presence of supernumerary teeth, or the ectopic relation of the permanent teeth themselves, it may be advisable to stimulate their eruption before the adjacent teeth which have already erupted drift into the spaces required for normal

positioning of the unerupted permanent teeth. This stimulation can be accomplished by a simple surgical technique which involves exposing the crown portions of the unerupted teeth. There are indications for use of this surgical procedure in any denture area, but it finds its most frequent application in the maxillary canine and mandibular second premolar areas.

Serial premature extraction of deciduous teeth is the third nonmechanical treatment procedure advised in the mixed dentition period. It is indicated in those cases where there is an insufficient amount of room for the erupting mandibular permanent incisors to establish themselves in nonrotated positions and with normal axial relations. Additional space can be created for these teeth and at the same time sufficient room can be left for the permanent canines and premolar by a process of serially and prematurely removing deciduous teeth. This process can be a permanently rewarding procedure only if arch length from one mandibular first permanent molar around to the first molar on the opposite side is adequate. Nance[7] believes that this arch length should exceed the combined mesiodistal widths of the crowns of all the mandibular permanent teeth mesial to the first molars by at least 3.4 mm. This is what he terms an "adequate leeway." In addition to "adequate leeway," he states that before advising the premature serial removal of deciduous teeth one must be assured that the patient has a Class I molar occlusion and then proceed with the extractions after inserting a preventive mandibular lingual arch wire.

The purpose of the preventive lingual arch wire is to preserve arch length and disallow any shortening of the first-molar-to-first-molar space by a forward shifting of these teeth, a danger which is quite imminent in the normal nonextracted mixed dentition, but more especially certain to occur when the process of serial premature extraction is employed.

The fourth and last treatment procedure of a nonmechanical nature which is recommended for the mixed dentition period is the serial extraction of deciduous and permanent teeth in Class I malocclusions where arch length is greatly deficient. This is a treatment procedure that is used in both arches and one that culminates in the removal of two maxillary and two mandibular premolars, typically all four first premolars.

The indications, according to Z. B. Lloyd,[26] for extracting deciduous and permanent teeth in Class I malocclusions where arch length is greatly deficient are: (1) normal arch relations; (2) severe lack of arch length or insufficient intracanine width in both jaws to accommodate incisors in nonrotated positions; (3) axial inclination of incisors (maxillary and mandibular) in normal range; (4) good facial balance; (5) overbite from slight to severe; and (6) age of patient between 7 and 9 years.

He has a precise and well-ordered schedule for removing the deciduous and permanent teeth involved.

Lloyd states that the contraindications to this form of treatment are: "Class I malocclusions that show lack of canine width in varying degree in the mandibular arch, with adequate arch length in the maxillae . . . and those Class I malocclusions that show a slight lack of intercanine width in both the

maxillary and mandibular arch should not be treated by serial extraction procedures. Beneficial results are doubtful in most Class II, Division 2 and Class III malocclusions. Also when there is an unusual breakdown of the first permanent molars, loss of one or more first permanent molars, the congenital absence of second premolars, or their malformation, the typical serial extraction procedure must be altered.''

SUMMARY

In the last quarter of a century, the attitude of orthodontists regarding the advisability of treating certain types of malocclusion has changed twice. From the viewpoint most men held in the 1930's, that almost all malocclusions were indications for treatment in the mixed dentition, the consensus changed to such a degree that only a few types of cases were deemed suitable for mixed dentition treatment.

Now the pendulum seems to be swinging back again!

Tweed[27] says that more than 50 per cent of his cases are taken from this mixed dentition group and he expresses the wish that it could be 100 per cent.

No small amount of the shift back toward more treatment in the mixed dentition period must be attributed to the rediscovery and use of extraoral anchorage.

A list of mixed dentition treatment indications, some involving mechanotherapy, others not, has been given and the list discussed briefly.

Perhaps orthodontists in the near future will rarely, if ever again, recommend, as orthodontists did in the recent past, that no treatment be started before the patient is 12 years old.

Indeed, the mixed dentition age bids fair to become the ''golden age'' in clinical orthodontic therapy.

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AIMS AND METHODOLOGY OF TREATMENT ACCORDING TO AGE GROUPS

Permanent Dentition Age Group

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WHILE I was preparing the present assignment, one constant thought presented itself: "There is one member of the A. A. O. who should be presenting this particular subject, namely, C. F. Stenson Dillon of Los Angeles, California." His understanding of orthodontic procedures and problems is quite profound, and his ability to see and explain the problems clearly is most enviable. We on the Pacific Coast, especially, have been most fortunate to have had him as our teacher and counselor. It is your loss, and mine, that he is unable to assume the present assignment.

It might be well to define *methodology* and *orthodontics* in order to establish a common ground for use in this discussion. Webster defines *methodology* as "a branch of logic dealing with principles of procedure, whether of theoretic or practical science." Several definitions of orthodontics have been made, and the following by McCoy[1] is as clear and concise today as when originally stated, namely: "Orthodontics may be defined as that science which has for its object the prevention and correction of the dental and oral anomalies." This definition is further elaborated upon by a later conclusion: "Orthodontics is a study of dental and oral development; it seeks to determine the factors which control growth processes to the end that a normal functional and anatomical relationship of these parts may be realized, and aims to learn the influences necessary to maintain such conditions when once established."

A study of the two definitions reveals that each is a multiphase procedure, with methodology supplying a series of logical steps for dealing in an orderly fashion with growth processes and with the prevention, correction, and stabilization of dental and oral anomalies. If we accept this understanding, a wide scope of responsibility is assumed in an attempt at corrective procedures.

In this event, a number of factors must be considered before final thought is given to the actual mechanics of the projected treatment, for there may be conditions present which will modify our usual approach to a particular type of case. We must be aware not only of the purely dental condition as presented, but of some highly important factors that are considered all too seldom in our eagerness to get on with the mechanics of treatment.

Presented before the American Association of Orthodontists, New Orleans, Louisiana, May, 1957.

In the realm of this discussion (permanent dentition) we are faced with the fact that prevention of the malocclusion is, to a great extent, practically an impossibility. Changes brought about by the loss of deciduous teeth, lack of restorations, faulty nutrition, and general physical and dental neglect are accomplished facts. While all growth factors are not entirely absent, we must realize that the patient has passed that age level at which we have the greatest possibility of doing the most good in attempting to direct and encourage growth. That phase of the discussion has been very well covered by the previous speakers.

This leaves us with the problem of dealing with the end result and attempting to unravel the etiological factors concerned with the case in hand. Among the factors that we must consider could be listed the following: (1) orientation and diagnosis; (2) health of the patient; (3) heredity; (4) habits which may have contributed to the original condition and which, if still present, may affect stability following treatment; (5) dental conditions, including caries, supernumerary, and missing teeth; (6) cooperation of the patient and the parents; and (7) appliance of choice.

A study of these few factors may greatly modify our thinking in terms of anticipated results and appliance therapy. They may even contraindicate treatment entirely. I am of the opinion that all too frequently the above factors are not considered in our haste to place an appliance and proceed with the treatment. I hope that I am wrong, but the fact remains that many of our treatments, my own included, would have had a happier ending if we had given more thought to this portion of our analysis. Orthodontic methodology, then, means more than appliance therapy. It encompasses all the knowledge that may be gathered regarding a particular case, so that a proper evaluation may be reached.

ORIENTATION AND DIAGNOSIS

In order to proceed logically with the evaluation of a case, it is necessary to have some means of classifying or relating the malocclusion to an established norm. The simple classification of cases into Classes I, II, and III is descriptive of tooth relationship and is suggestive, to a degree, of the maxillary and mandibular positions in relation to the skull. While these classifications still serve a good purpose, they are not as accurate as originally intended. During the years there has been a constant effort toward a better means of orienting the component parts of the dental mechanism to each other, and also to the skull, through the use of stable points of reference. Cephalometrics is one way in which this has been done; the resultant studies have afforded a means of this orientation and the establishment of an over-all norm for comparative purposes. Many investigators have taken part in these studies, each one studying along some tangent of his own. This has resulted in considerable confusion in the minds of many of us at times. More recenly, however, there appears to be a more liberal agreement on the essential results, or objectives, of cephalometric orientation and the over-all acceptable effect on dental and soft tissue position and esthetics. This recently was very well brought out by Riedel[2]

when he stated: "The public's concepts of acceptable facial esthetics are apparently in good agreement with the standards established by orthodontists on the basis of normal occlusion." His conclusions were based upon a study of thirty Seattle Seafair Princesses, and the facial contours presented were markedly at variance with some of the ideals, from an orthodontic standpoint, that have been suggested in past years. All were beautiful girls, as you might well imagine. In spite of the fact that the facial esthetics covered a considerable range in convexity, they still fell within the limits of acceptance. This is a healthy situation, for I do not believe that the true purpose of cephalometrics was ever intended to establish arbitrary standards of facial form and ignore the ethnic background. However, the results of cephalometric studies have proved to be a valuable aid in evaluating the growth potential and changes occurring during observation and treatment. True enough, many of the patients in the permanent dentition groups do not have the potential for facial growth that is possessed by those in the lower age brackets, but whenever possible it is well to take advantage of what growth may remain. Moore[3] has estimated that the female maturation changes have taken place by the age of 11 to 13 years, while the male face has several years more in which some growth advantage may be used.

There are other methods of orientation that may be used, such as Simon's gnathostatic evaluation and the jugal buttress of Klaatsch as used by Atkinson.[4] The important role played by Simon cannot be overemphasized, for, as pointed out by Graber,[5] it was through his research that modern orthodontics became more conscious of basal relationships, cant of the mandibular plane, and facile profile. It makes no difference what method you may use, as long as you have faith in the dependability of the answers given; as Dillon[6] contends, you must accept the verdict upon the completed cases as well as upon the contemplated cases.

While the facts of cephalometric appraisal have given data for comparison of growth within certain age groups, we should not forget that there are many factors which may alter the picture for the individual patient. One of the important factors is heredity. The pro and cons have been discussed for many years; however, there is agreement that heredity does have a vital place as an etiological factor in facial form and that, therefore, it affects the orthodontic problem. Salzmann[7] states that evolutionary processes show a tendency to smaller mandibular growth and, when seen in several generations of the same family, this can be accepted as an indication of hereditary influences. Anderson[8] augments this belief by stating that "variations in human development are definitely tinted with inheritable influences; and with the mingling of racial types, cross currents of deep significance become increasingly evident." There have always been discussions relative to the degree of influence exerted by heredity and environment, and these questions are answered quite clearly by McCoy[9] in his statement: "Heredity lays down the limits to which an organism may grow, while environmental influences determine how fully these limits are achieved."

In the realm of this discussion (permanent dentition) we are faced with the fact that prevention of the malocclusion is, to a great extent, practically an impossibility. Changes brought about by the loss of deciduous teeth, lack of restorations, faulty nutrition, and general physical and dental neglect are accomplished facts. While all growth factors are not entirely absent, we must realize that the patient has passed that age level at which we have the greatest possibility of doing the most good in attempting to direct and encourage growth. That phase of the discussion has been very well covered by the previous speakers.

This leaves us with the problem of dealing with the end result and attempting to unravel the etiological factors concerned with the case in hand. Among the factors that we must consider could be listed the following: (1) orientation and diagnosis; (2) health of the patient; (3) heredity; (4) habits which may have contributed to the original condition and which, if still present, may affect stability following treatment; (5) dental conditions, including caries, supernumerary, and missing teeth; (6) cooperation of the patient and the parents; and (7) appliance of choice.

A study of these few factors may greatly modify our thinking in terms of anticipated results and appliance therapy. They may even contraindicate treatment entirely. I am of the opinion that all too frequently the above factors are not considered in our haste to place an appliance and proceed with the treatment. I hope that I am wrong, but the fact remains that many of our treatments, my own included, would have had a happier ending if we had given more thought to this portion of our analysis. Orthodontic methodology, then, means more than appliance therapy. It encompasses all the knowledge that may be gathered regarding a particular case, so that a proper evaluation may be reached.

ORIENTATION AND DIAGNOSIS

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I am of the opinion that in the practice of orthodontics heredity is not generally credited with its true importance. Possibly this is because we are immersed in the immediate corrective problem at hand and, to some extent, because our understanding is not too profound. However, it undoubtedly will remain a problem, and possibly will grow, until such time as, Heaven forbid, selective mating is the law.

HEALTH OF THE PATIENT

A thorough and systematic study of the physical background of the patient is one of the important steps in the analysis of any case, and the findings may have a profound effect on the projected treatment. The findings may dictate the time of treatment, the approach to the problem, and the distance that we may expect to proceed toward our ideal; they may even indicate that treatment should not be attempted, at least not without competent medical guidance.

We have been advised on this fact for many years by numerous clinicians and writers. It is nothing new, but how many of us avail ourselves of the advantages offered? I am thinking in a personal vein at the moment, for in spite of lectures over the years by such authorities as Becks and Massler, there no doubt are many cases in which my results would have been much more successful as a result of closer adherence to their teachings. Because of their research, however, we are in a favorable position to judge the fundamentals of our cases and to determine when to ask for suitable medical cooperation.

A thorough and understanding study of good oral radiographs is of primary importance. If sufficient evidence of a dyscrasia is present, collateral studies may be made with the use of carpal radiographs and headplates in order to gain confirmation or denial of our original findings. Any evidence disclosed by these studies should not be ignored, for we are dealing with a living organism and should understand any limitations which may be placed on our treatment. Strang[10] places considerable emphasis on family, as well as patient, physical histories. He feels that the health and background of the patient are very important criteria in approximating the degree of success that we may expect with our treatment. There surely can be no disagreement with his conclusions, but how often do we fail to utilize, to even a minor degree, the facts that are present for our consideration? How often, in our haste, do we ignore or fail to see such items as pulp stones, resorbed roots, bone dyscrasias, chronic infections of the teeth, tonsils, and sinuses, active caries, and numerous other items which should give us some warning in our study of the case? I hesitate to give you an answer. In spite of approximately 200 medical examinations in the past years, wherein my patients exhibited definite physical deficiencies, I fear that I have overlooked a number of cases that would have had definitely better orthodontic possibilities if the patients had been under medical guidance.

Some of the answers cannot be given without medical advice and cooperation. It is folly for any orthodontist to attempt an answer purely on the basis of what is presented clinically and radiographically. If any suspicions are

raised, there are many competent physicians who are able and willing to conduct a thorough physical examination. What is the basis for such diagnosis? The mere presence of osteoporosis and root resorption? I wish the problem were that simple. Since we are contemplating orthodontic treatment which may last for several years, it is well to take the time to consider the background of the patient if any suspicion is present. For your consideration, I would like to present a few examples, covering a cross section of ages and physical backgrounds, that may be encountered. They are not all typical examples of a simple dyscrasia as presented in the texts, but are representative of what is found in an everyday orthodontic practice.

Fig. 1 shows Patient J. M., a 9-year-old girl, who presented a Class I malocclusion and severe close-bite. A marked underdevelopment of the entire skeletal system was quite evident. Orally, the maxillary and mandibular arches were very restricted in the lateral dimensions. While efforts at hygiene were good, the gingival tissues were not of good texture and were inclined to be hemorrhagic. Short roots, unhealthy gingival tissues, and extreme lack of physical and dental development were sufficient evidence for further investigation. Medical examination revealed that the patient was underweight and anemic, that she suffered from seasonal allergies producing so-called "hay fever," and that she had a basal metabolic rate of -15 which, upon further study, was differentiated as hypopituitary.

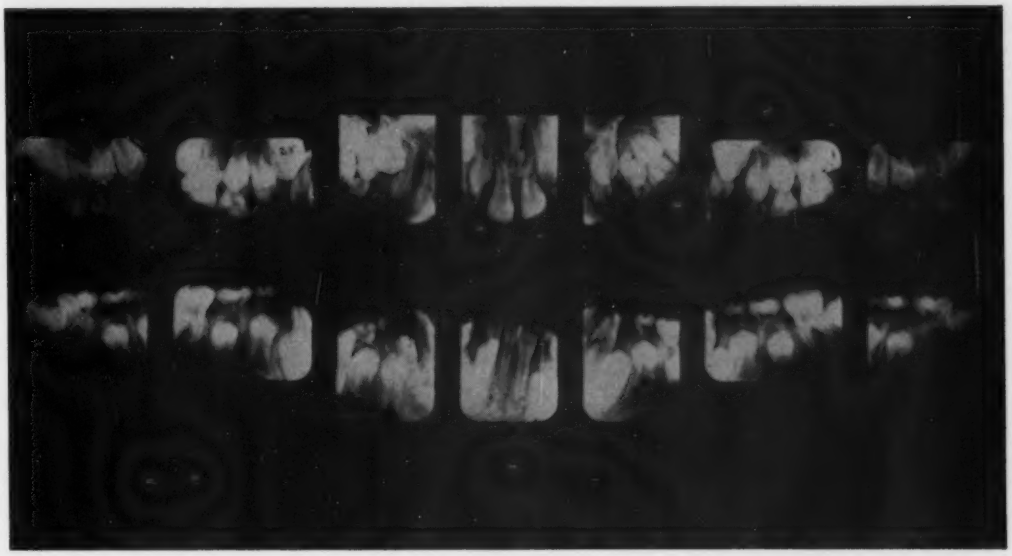

Fig. 1.—Patient J. M., aged 9 years. B.M.R., -15 (hypopituitary). Note short, pointed roots. The patient is underdeveloped skeletally and dentally.

All things considered, this patient did not present a good orthodontic risk. With sufficient time given for medical attention, however, a serial extraction of deciduous teeth was planned, culminating finally in the elimination of four premolars and a simple treatment involving the use of a headcap. A fair result was obtained from the standpoint of esthetics and function.

Fig. 2 shows Patient L. L., a girl aged 11 years, who has a Class II, Division 1 malocclusion. This case should not be presented as a typical orthodontic problem. It is so radical that it would rarely be encountered, but it is presented in order to show what good medical attention can accomplish. By the time the patient was 2½ years of age, radical

surgery in the form of complete castration had been performed. During the intervening years, careful medical supervision has been maintained, with periodic metacarpal studies being made. These studies have shown no marked deviation from the low of a normal range. Tooth eruption has also followed a fairly normal pattern, with the main discrepancy to date being short, pointed roots. The physicians are preparing for hormone therapy, and also are planning to cope with the possible psychological problems facing the patient in the future. Orthodontic intervention is desired, and headcap therapy is soon to be instituted. It is hoped that a serviceable result will be obtained, without unfavorable tissue reactions.

Fig. 2.—Patient L. L., aged 11 years. Complete castration at age 2½ years. Full medical control.

Fig. 3 shows Patient H. G., a 13-year-old boy. He has a Class I malocclusion with close-bite, large tongue, and traumatic damage to the tissues lingual to the maxillary central incisors. No root resorption is evident, but there is considerable evidence of alveolar osteoporosis. The tissue tone orally was very poor. A medical examination revealed a B. M. R. of -24, a severe anemia, nutritional deficiencies, and some allergies. The patient was overweight, lethargic, in a constant state of fatigue, and exhibited no interest in things around him. Scholastically, he was one year behind his class. After one year of close medical supervision, a new world had opened up for the patient. His description of the change was: "It's the first time in my life that I ever woke up before noon," and I feel that his remark very well described the situation. Orthodontic intervention originally would have been a failure, but now stood a fair chance of success, provided the medical program was continued.

Fig. 4 shows Patient H. B., a 21-year-old woman, presenting a Class I malocclusion with a close-bite. The radiographic examination revealed considerable root resorption of the four maxillary incisors, with evidence of osteoporosis throughout the denture. A medical examination disclosed a B. M. R. of -14, with a pituitary background. The dental history revealed that orthodontic treatment had been terminated five years previous to the present radiographs. As the case now stands, there is no possibility for orthodontic aid. The maxillary left lateral incisor was lost, and a bridge of more or less transient nature was placed.

A question now arises regarding the responsibility of orthodontics in cases of this kind. Did the appliance therapy bring about the root resorption, or at least hasten the result? Should we ignore any early signs of dyscrasias?

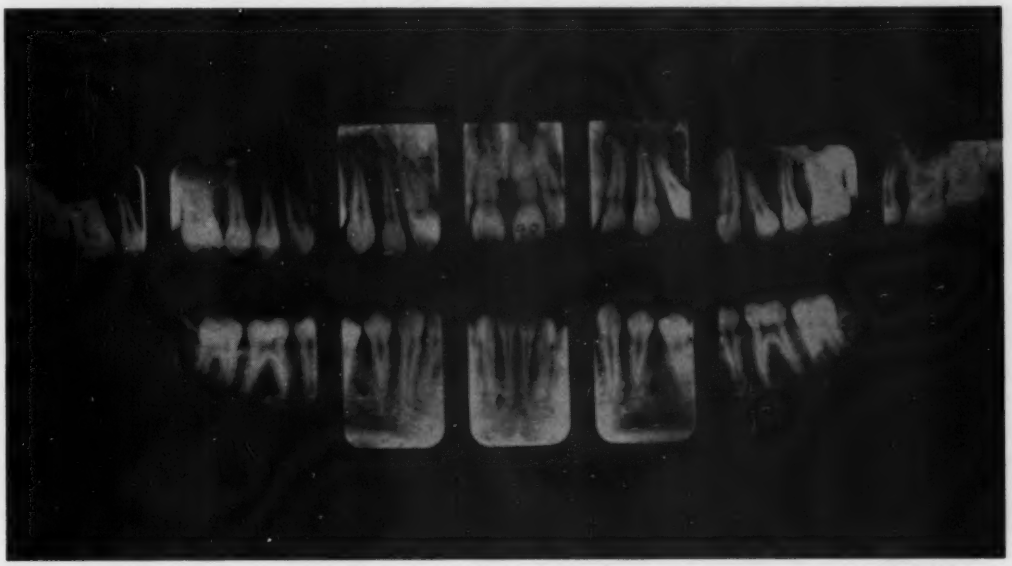

Fig. 3.—Patient H. G., 13 years of age. Medical examination revealed B.M.R. of -24, osteoporosis, anemia, nutritional deficiencies, and allergies.

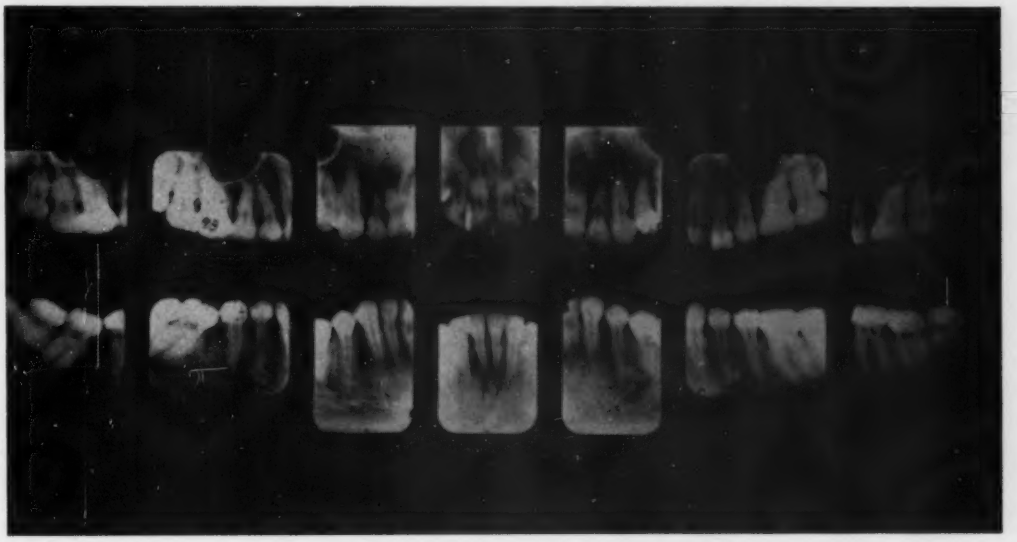

Fig. 4.—Patient H. B., aged 21 years. B.M.R., -14 (pituitary). Radiographic examination revealed resorbed roots and osteoporosis. There was a history of previous orthodontic treatment.

Or should the patient be advised of the need of a medical examination to prove or disprove any questions that may be in the mind of the orthodontist regarding possibilities, or limitations, of treatment? I sincerely believe that our methodology requires that we make such inquiries for the benefit of the future

health of the patient and for the stability of any treatment which we might plan. Some of the symptoms are so obvious that they can hardly be missed, while others may be rather obscure. The borderline cases that might escape our detection are the most troublesome. These are the patients who, upon receiving adequate care from a physician, may receive reasonable orthodontic treatment with some assurance of success. I feel somewhat as Dillon[6] did when he said: "How much better it is to learn and accept these conditions prior to orthodontic intervention, than to wait until afterward and then take refuge in them."

HABITS

One of the basic precepts in the approach to an orthodontic problem is the determination of the causative factors and, furthermore, of whether or not they are still existent. At times this presents one of the more difficult items in our diagnosis. If the factors are still active, and are undetected, the prognosis for successful treatment is lessened. Many of the grosser items among the etiological factors are easily detected, but there is one classification that many times is not noticed or is dismissed as of minor importance. That particular classification relates to "habits" or "mannerisms." This phase of our problem is important enough that Anderson[11] states that abnormal habits, if they exist, *must* be discontinued before corrective measures can be successful.

Some psychologists have estimated that upward of 80 to 90 per cent of our daily acts are of the habit variety. Fortunately, most of these habits, whether mental or physical, are beneficial. No doubt the old quotation, "As the twig is bent, so grows the tree," could be applied very well to this particular subject. Although the first movements in any habit are conscious, in due time these same movements are performed unconsciously. In orthodontics we should be concerned with any habits that are capable of causing adverse pressures in and around the mouth. Early studies by Stallard[12] emphasized this fact by revealing that 15 to 20 per cent of malocclusions showed signs of pillowing or postural habits. When we consider other indulgent habits, such as thumb-sucking, lip-biting, and pressure against the face while reading or viewing television, and assorted tongue habits, we have a rather imposing variety of pressures working against any efforts toward corrective procedures. I believe that it was Samuel J. Lewis who once published the pressures exerted in hand and pillowing habits. In the act of resting the hands against the face while reading pressures of 10 to 20 pounds were exerted, and in pillowing or sleeping 5 to 15 pounds of pressure was present. An early lesson was afforded me by a patient repeatedly bending both the maxillary and mandibular posterior segments of a McCoy open-tube labial appliance. The posterior segments were made of .040 inch gold platinum wire, and the effort needed to bend them convinced me that Stallard and Lewis were serious in the study of pressures and their possible effects around the face. How could satisfactory results be expected in a case of this kind, where the counter measures taken by the patient exceeded by far any corrective measures instituted by orthodontic appliances?

The outstanding work done by Whitman[13] in recent years is quite illuminating. His efforts in habit controls take considerable time, but this is compensated for by more stable end results. His conclusions with regard to the actions of the tongue in relation to open-bites are particularly interesting, as when he states that most open-bites are not a deformation of skeletal pattern, but are the result of perverted use of the tongue in swallowing.

The importance of abnormal pressures in the production of malocclusions is emphasized by Tulley[14] in his study of adverse muscle forces. His classification of the atypical action of the tongue into *nondisbursing* and *disbursing* behavior is very descriptive. The tongue, in this atypical behavior, is a powerful force militating against any efforts toward corrective orthodontics. Ignoring factors of this type in our study of a case is a certain way of adding one more skeleton to the closet, and, without a doubt, we all have them. I believe that time spent in searching for such factors is well spent, for it may mean the difference between success or failure in many cases. A few examples of tongue activity may bring the point more clearly to mind.

Patient M., shown in Fig. 5, was a 24-year-old woman. This was a Class I case, presenting a bilateral cross-bite with an open-bite in the anterior region. There was very strong lip function, which prevented any forward movement of the maxillary or mandibular teeth. Mouth breathing was not present, but a nasal irritation produced an almost constant sniffing. This was accompanied by a drawing-in of the cheeks in the posterior segment of the mouth, an anchoring of the tongue between the maxillary and mandibular incisors, and an almost spasmodic restrictive action of the lips. The result is quite apparent.

Fig. 5.—Patient M., aged 24 years. Nasal irritation and sniffling are accompanied by abnormal lip and cheek action and thrusting of the tongue between the incisors.

Fig. 6 shows Patient K. W., a 14-year-old girl, who presented a Class II, Division 1 malocclusion with an open-bite and bilateral cross-bite. There was a tongue thrust during swallowing and examination revealed a lack of sensory function of the soft palate and throat. Examination of the soft tissues and the uvula with instruments produced no normal tissue reaction or gagging reflex. This condition has been described by Dillon as an "anesthetic throat" in which normal swallowing reactions are absent. In order to swallow, the tongue is anchored between the anterior teeth and mechanically roles the bolus of food backward into the throat. There is an accompanying contracture of the lips, as well as a severe tensing of the mentalis muscles.

Fig. 7 shows Patient J. Mc., a girl aged 12 years, who presented a Class I malocclusion, with an open-bite and spacing of the teeth. A large tongue was present and this was further complicated by the presence of a lingual frenum. As a result of this, there was a speech impediment, and a constant pressure was exerted against the lingual surfaces of both the maxillary and the mandibular teeth. This condition of ankyloglossia is found in varying degrees of severity, and many times it is overlooked as a contributing cause of malocclusion. Many more examples of tongue activity could be given, but for the present I believe that these will suffice.

Fig. 6.—Patient K. W., 14 years of age. Anesthetic throat has resulted in abnormal swallowing with tongue thrust.

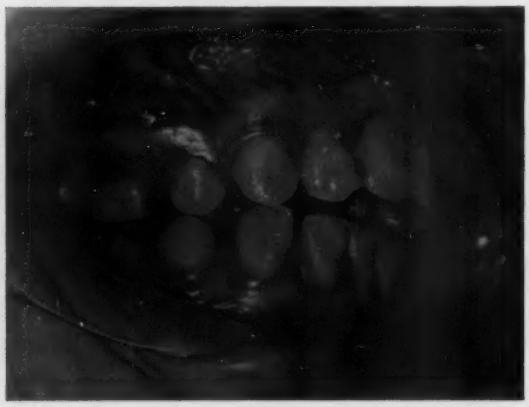

Fig. 7.—Patient J. Mc., 12 years of age. The patient has large tongue and ankyloglossia.

We are all familiar with the typical results of hand pressures and with the classical examples of thumb-sucking. These do not need further elaboration. However, I do not believe that enough attention has been given the atypical tongue activity in the production of orthodontic abnormalities. Baker's[15] studies of the tongue and dental functions revealed that 35 per cent of the cases studied had abnormal tongue position when at rest; many of these were obscure and not easily detected. This is a significant percentage and warrants serious attention during consideration and planning of any orthodontic procedures.

DENTAL CONDITIONS AFFECTING TREATMENT

Some of the factors that must be considered under our methodology or analysis prior to a discussion on treatment could be classed as "roadblocks" to successful treatment. The solution to some of these problems is rather simple, but others present factors which may change the character of what ordinarily would be classed as a routine treatment.

Missing teeth, due to natural absence or extraction, present a problem that must be answered many times. Do we place the adjacent tipped or malposed teeth into their normal position, or do we attempt to close the space and prevent the need of bridge replacement? Most authorities agree that the mandibular second premolars and the maxillary lateral incisors are most frequently absent, while the maxillary and mandibular first molars are most often lost due to caries and extraction. Early loss of the first molars presents no particularly serious problem but if they are lost following the eruption of the second molars, a different situation is presented. Following early loss of the first molars, the second molars, especially the maxillary ones, will move occlusally and mesially into contact during eruption. In the case of the mandibular second molar, orthodontic assistance will usually be needed in uprighting and occasionally closing any remaining space. Function is re-established and the third molars, in turn, have a fair chance to erupt and assume their part in the function and support of the denture. The following is a typical example of the early loss of the maxillary first molar.

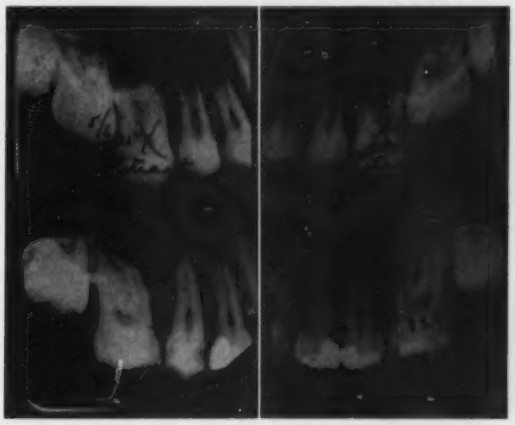

Fig. 8.—Replacement of maxillary first molars with second molars in an 11-year-old girl.

The patient was an 11-year-old girl (Fig. 8). She presented a Class I malocclusion with posterior teeth almost end to end. The first molars were hypoplastic and had been refilled several times. Prognosis for eventual usefulness was poor. Extraction was advised before the second molars erupted further. Two years later, radiographs revealed that the second molars had erupted into occlusion and the third molars were well on the way. The premolars had settled distally into normal occlusion. No orthodontic treatment was performed in this case.

First molars that have been lost too late to allow a favorable mesial drifting of the second molars present a difficult problem at times. Occlusal interference and collapse of the cortical plate often preclude any successful attempt at moving the second molar mesially as far as desired. This point is particularly true in the case of the missing mandibular second premolars and the early loss of the second deciduous molars.

Missing maxillary lateral incisors present a unique problem of their own, and a careful evaluation of the facts must be made. In this instance, the canines usually have erupted partially or entirely into the position of the lateral incisors and often, from the standpoint of esthetics, this leaves much to be desired. Do you reopen the lateral incisor space and restore the missing units with bridgework, or do you allow the canine to occupy the lateral position? Is the canine so shaped that by careful grinding it can be recontoured to harmonize with the central incisors, or does it have the long narrow incisal and angular labial planes that are incapable of being polished to any semblance of a lateral incisor? Does the lip function in a manner that reveals the anterior teeth to such an extent that a compromise would be esthetically impossible? These are some of the questions that must be answered in the case of missing maxillary lateral incisors, for esthetics is one of our major problems and in this particular instance it is of primary importance to the patient.

One of the roadblocks encountered in the treatment of Class II malocclusions is the disturbing problem of distal movement in the maxillary posterior segments. This phase of treatment is subscribed to by all techniques and, while most clinicians caution that we must be careful lest the mandibular anchorage be disturbed, few have much to say regarding a disturbance in the maxillary tuberosity region during this distal movement. If there is difficulty, a cursory examination will reveal the reason: there simply is no place for the distally moving molars to go in many cases. Sicher[16] explains that "due to phylogenetic changes, a shortening of the jaws is, in modern man, already further advanced and more firmly established than the shortening of the dental arch." From the practical aspect, this is demonstrated by the buccal eruption of second molars, as well as third molars, giving answer enough to the problems encountered in this area.

In this phase of the discussion of methodology, we must again remember that there is little, if any, advantage to be gained from growth; to a great extent, therefore, we are faced with a definite problem of tooth movement.

Two reasonable solutions to this problem in the maxillary tuberosity area are: (1) remove the third molars or (2) remove the second molars, allowing the third molars to erupt subsequent to the proposed distal movement of the first molar. Removal of the second molar eases the load on anchorage units and provides room for distal movement of the first molar. Moore[3] describes the successful use of this method in several difficult permanent dentition patients, and Graber[17] subscribes to the theory, feeling that it is more advantageous than extracting the maxillary first premolars in some cases, due to difficulties encountered in space closure.

Morehouse[18] presented his first paper on the removal of second molars in 1918. Several publications of his findings followed, the last being published in 1930. It was my privilege to be associated with him for some years and, with little exception, I have found his philosophy on second and third molars as sound today as it was originally. His first and last admonition on the subject was *"Be certain you have a third molar to work with."*

The examples that follow are somewhat typical of the conditions found in the maxillary tuberosity and the resulting behavior following relief.

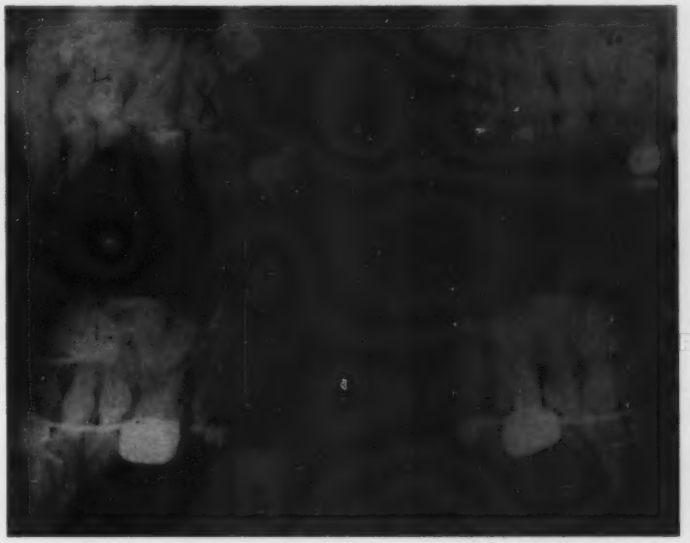

Fig. 9.—The patient is a 16-year-old girl with a Class II malocclusion. Extraction of maxillary second molars was followed by replacement by third molars.

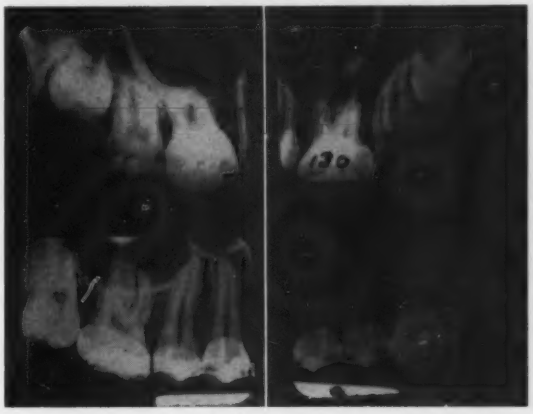

Fig. 10.—The patient is a 14-year-old girl with a Class I malocclusion. Carious maxillary second molars were extracted and replaced by third molars.

Fig. 9 shows a 16-year-old female patient who presented a Class II, Division 1 malocclusion with close-bite. Small maxillary tuberosities and the presence of third molars prevented any possibility of distal movement. Removal of the second molars during the early part of the treatment relieved the situation, and the desired distal movement was apparently produced.

The patient shown in Fig. 10 was a 14-year-old girl, who had a Class II, Division 1 malocclusion with extreme close-bite. Previous attempts at orthodontic treatment had failed to reduce the Class II relationship. To relieve the load on the mandibular anchorage, the second molars were removed. A full banded appliance, intermaxillary elastics, and headcap treatment followed. The carious second molars were replaced by the third molars upon eruption.

Fig. 11.—Patient S., a 17-year-old girl with a Class I malocclusion. Removal of all carious maxillary second molars was followed by replacement with third molars.

Fig. 12.—Same patient as in Fig. 11, at age 20. Note replacement of maxillary and mandibular second molars by third molars.

Fig. 11 shows Patient S., a girl aged 17 years, who presented a Class I malocclusion with a tendency toward an open-bite. Because of caries and large restorations on the maxillary right second molar, and a favorable angle of the third molar, the decision was made to extract the second molar and allow a replacement by the third molar. Due to the adverse angulation of the maxillary left third molar, and the possibility of future pathology in the mandibular right and left third molar areas, the usual decision would have been to remove these teeth. However, large restorations and recurrent caries were a problem in all second molars. Contrary to the usual rule, all second molars were removed.

Fig. 12 shows the preceding patient's maxillary and mandibular posterior areas approximately three years later. The maxillary third molars have erupted into occlusion. The mandibular third molars are on a slight angle and, had the opportunity presented, should have been uprighted and given better angulation. However, occlusal grinding had to suffice. This is presented for consideration, not as a routine maneuver, but as a reminder that the future health and stability of a denture must be considered in our evaluations.

The factors considered to this point are integral parts of the necessary data upon which to base not only a diagnosis, but a prognosis as well. The etiological factors that contributed to the malocclusion may be the very ones which determine that treatment should be limited or not undertaken at all. Orientation has determined the degree of abnormality present, when compared to a norm, and hereditary factors may have modified these findings as they relate to the individual patient. The physical background has produced information relative to the capabilities of the patient undergoing orthodontic treatment now or in the future. Habits, impacted teeth, missing and supernumerary teeth, and the general dental health of the oral cavity have been evaluated, and their effect on treatment and future stability of the denture has been determined. This information, together with study models and photographs, is a necessary part of an orderly methodology. From this, we may make our decision relative to the therapy to be employed.

There is, however, one additional bit of information which may have as great a bearing on the success or failure of treatment as any gathered to this point. This information could be classified under the heading of cooperation. We are dealing with a wide range of temperaments, over a long period of time, and this fact alone demands careful consideration during the final evaluation of any case. In the permanent dentition group there is not always time to observe cases and psychologically arrange an understanding, as with some of the younger age groups. Fortunately, most of the patients in this group present no problem and the parents are usually most cooperative. However, we do have some who are difficult, and care must be used in differentiating between the *nervous patient* and the *problem child* and between the overanxious parent and the indifferent parents who are interested only in their own convenience and the fee. We are dealing not only with the patient, but also with the parents; for that reason, a thorough understanding of the problems and responsibilities entailed in orthodontic procedures is necessary. Regularity of appointments and following of necessary instructions are essential. If orthodontic treatment must continuously be secondary to social engagements or to the whims of the patient and parent, failure of treatment will often result. Broken appointments, damaged appliances, and lack of cooperation form the gallows upon which many an orthodontist has been drawn and quartered. The timid, nervous patient will respond to an understanding patient approach and, with intelligent, fully informed parents in the background, a successful treatment should follow.

In recent years this problem has been increased, due not only to a greater number of patients desiring orthodontic treatment, but also to necessary

changes of residence by the parents. Usually moves of this kind may be anticipated far enough in advance to permit the use of judgment regarding the starting time of treatment. Many of these cases have developed into problems as the result of our own lack of regard for the exigencies of the situation. Patients who have been under treatment by a series of orthodontists are likely to develop into problems due to varying personalities of the operators, changing techniques, loss of time entailed in moves, misunderstandings regarding philosophy of treatment and anticipated results and, sorrowfully enough, by plain indifference at times on our own part. The transfer cases represent a serious problem to all of us. It is important enough that the obvious possibilities should definitely be included in our methodology.

No attempt will be made to recommend any specific appliance therapy, for all of us have at our command various techniques with which we are familiar and which are capable of performing the necessary tooth movements. These techniques should have a basic philosophy which recognizes the need for stability of anchorage and crown and root control. This is fundamental. In the permanent dentition groupings the denture is complete, there is not much to be expected so far as growth and development are concerned, so a decision regarding extraction or nonextraction treatment can readily be made. Our problem is to be mentally flexible with regard to the orthodontic needs of the particular patient, and to use an appliance that will fulfill those needs, rather than arbitrarily fitting the case to the appliance. It is natural that training and experience will lead to the use of a favored appliance in the majority of cases. Perhaps you favor a multiband technique, but some patients may not need or will not physically tolerate the disruption occasioned by a full banded appliance. The usual appliance of choice may be four molar bands and plain labial and lingual arches but, as in premolar extraction cases, difficulty in tooth control will usually be evident and a full banded appliance capable of individual tooth control will be needed. It may be that the appliance of choice is not acceptably performing as anticipated and a change may need to be made. It is folly to insist that the procedure, if not satisfactory, be followed to the ultimate end when other means are available. The Angle, Johnson, Oliver, McCoy, and Universal appliances give a wide diversification and will cover almost any situation presented. A study of transfer cases, extending over several years, has convinced me that no one appliance has all the virtues and that a study by all of us of the limitations would be in order. I cannot help but agree with Graber[19] when he states: "We must be on the constant lookout for the tendency to let the limitations of the appliance rationalize our philosophy of treatment."

Our methodology is finished, and the appliances of choice have been designed and installed. I have mentioned just roughly the major factors that should be considered before arriving at the point of actual treatment. No doubt there are other factors that will be important in individual cases. This

brings orthodontic judgment into play, for it must be used from the first to the last steps in our procedure. The following is an example of lack of planning or methodology.

The patient shown in Fig. 13 was a 17-year-old girl with a Class III malocclusion. The case as presented had been under treatment for three years, with the present appliances continually in place. The sum total of records is presented in Fig. 14. There were no radiographs, no other models, no photographs, and no treatment plans. The appliances were designed and made by an orthodontic laboratory.

Fig. 13.

Fig. 14.

Figs. 13 and 14.—The answer to the laboratory's dream.

We are all inclined to smile and be a bit smug when confronted with routines of this kind, but it has a serious aspect. There is a growing demand for orthodontic services, and to many people that service is evidenced by a few bands and some miscellaneous wires. A tooth moved here or there indicates that progress is being made, and therefore is representative of orthodontics. No conscious thought is given to such orthodontic aims as mastication, speech, respiration, and growth and development.

Orthodontics, as we know it, has a great deal to lose by such practices, and it behooves us to set better examples by adhering closely to our methodology and exercising mature professional judgment. My plea is for broader vision in our approach to the subject of diagnosis and treatment and for realization that orthodontics cannot be reduced to a mathematical science. Let us face the fact that physical backgrounds are important and that genetics is a vital factor. These are items that cannot be measured and must be understood and accepted. Plans must be made to accentuate or compensate for such influences. In short, let us broaden our concept to include all the information and help at our command. Let us search and seek, ever vigilant for that which is helpful and ever on guard against that which is harmful. Let us observe without bias. Let us look carefully and, above all, let us *see* that at which we are looking.

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1251-1252 PAULSON MEDICAL DENTAL BLDG.

SKELETAL DISHARMONIES AND MALOCCLUSIONS

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THERE is no doubt that many, if not a majority, of malocclusions are caused by skeletal disharmonies. It is important, therefore, to have a thorough knowledge of skeletal growth in general and of growth of the skull and face in particular. Skeletal growth is based on three well-integrated factors: (1) growth of the model tissue; (2) growth of bone tissue; and (3) modeling resorption. In long bones, which often, and rightly, are used to demonstrate skeletal growth, the model tissue is cartilage. Growth of the cartilage, even before bone tissue becomes apparent, and later growth of all the derivatives of this model cartilage, namely, epiphyseal and articular cartilages, determine the over-all size of a bone, primarily its length. Since, however, the growing cartilage is always destroyed and replaced by bone, growth of bone tissue plays an equally important role. Likewise, the increase in thickness of any of these bones, the formation of ridges, protuberances for the attachment of muscles, are also founded on growth of bone tissue. Finally, the ultimate shape of a bone and its internal structure, for instance the size of the marrow cavity or the elegant shape of the shaft at its junction with the epiphyses, is carved out, as it were, by modeling resorption.

Just as in any other bone, these three factors are active in the growth of skull and face. If one wants to understand the growth of the skull, it is first important to realize that the skull, if we exclude the hyoid bone and the ossicles in the middle ear, consists biologically of two bones only, the mandible and the cranium. The cranial bones, conventionally enumerated as occipital, sphenoid, parietal bones, maxilla, and so on, are not comparable to any one of the other bones of our skeleton, but rather to parts of a developing and growing bone. Thus the humerus, for example, consists at some time of its development of eight distinct bony parts: the shaft, the head, the greater and the lesser tuberosity, the trochlea, the capitulum, and the lateral and medial epicondyle. Just as these are first united or, if you will, separated by cartilaginous plates, just as they gradually fuse among themselves and finally with the shaft, in the same way the different bones of the skull develop as distinct bony parts and gradually fuse to form first the conventionally enumerated cranial bones and finally the cranium itself. That the mandible is a separate bone does not need any elaboration.

If we realize that the cranium (skull minus mandible) is, biologically speaking, one bone, then our next question is: What is the model tissue for this

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complicated bone? The answer is well known: at the base of the skull it is cartilage, just as it is in the humerus, the ulna, the vertebrae, the ribs, and so many other bones of our body, but in other parts, at the top of the cranial vault or in the face, it is connective tissue. Do we not speak of the parietal bone as a membrane bone, meaning that the bone tissue there replaces a membrane, that is, connective tissue, just as the bone developing in the shaft of the humerus replaces cartilage? This means simply that the sutures, better called syndesmoses, are comparable to a synchondrosis, the joining of bones by cartilage at the base of the skull, and that the connective tissue between two bones at a suture plays the same role as the cartilage at the base of the skull. These structures, connective tissue at sutures and cartilage at synchondroses, not only are homologous to each other but are homologous to epiphyseal or articular cartilages in long bones. Thus, there cannot be the slightest doubt that the growth of the cranium (skull minus mandible) depends in its over-all dimensions on the growth of cartilages at the base of skull, connective tissue at the sutures in other places, and, of course, on the simultaneous replacement of these growing tissues by bone. Also the thickening of the skull, the elaboration of processes, or bosses or ridges, such as the occipital ridge, the mastoid process, eyebrow ridges, and many others, depend on the growth of bone tissue. That modeling resorption is indispensable for the carving out and ultimate shaping of the cranium does not need any elaboration. One has only to think of the necessary flattening of the bones at the vault of the skull, for instance, the parietal bone, during the growth of the brain cavity, or of the development of nasal sinuses, to realize the importance of modeling resorption.

Turning now to an appreciation of the growth of the mandible, on which there is, on the whole, less controversy than on any other aspect of the growth of skull and face, we realize that in some ways the mandible is a unique bone. For example, the mandible develops primarily as a membrane bone, that is, within the connective tissue lateral to the primary skeleton of the first branchial arch, Meckel's cartilage. However, while at first the mesenchymal cells of the mandibular arch differentiate into osteoblasts and form bony trabeculae, later the same undifferentiated mesenchymal cells differentiate into chondroblasts and form, at the future condylar process of the mandible and to some degree in other areas, cartilage. When this cartilage has been established, it takes over as the model tissue of the mandible. Its growth determines the over-all size of the mandible and, in turn, as it grows, it is replaced by bone. Growth of bone tissue is necessary not only to replace the growing cartilage but also to form the angular process of the mandible, the coronoid process, most of the alveolar process, and the reinforcements of the mandible, for instance, in the region of the chin. Modeling resorption at the neck of the mandible, at the anterior border of the coronoid process, and in other areas is equally important.

Thus, it would seem that the mandible behaves very much like any other long or tubular bone, at least from the time cartilage has appeared in the condylar area. But this is only partly true. While the growing cartilage provides

the model tissue for the mandible, we have to go one step further and ask: Does this cartilage in the mandibular condyle grow in the same manner as that in other parts of the skeleton, as in epiphyseal cartilages, in articular cartilages, and in the cartilages at the base of the skull, for instance, between the 4 parts of the occipital bone, between the parts of the sphenoid bone, and between sphenoid and occipital bone? And here we can observe a highly significant difference. The epiphyseal cartilages, the articular cartilages, and the cartilage at the cranial base grow by interstitial or expansive growth. That means that cells of this cartilage proliferate by mitotic division, form new cartilaginous intercellular substance, and thus spread the cartilage apart. Expansive or interstitial growth, therefore, rests on the division of already differentiated cells, the chondrocytes. On the other hand, it is known that cartilage can and does grow by what is aptly called appositional or additive growth. For instance, a costal cartilage grows longer by expansion, but thicker by apposition. That means that in the deepest layers of the perichondrium undifferentiated mesenchymal cells gradually differentiate into chondroblasts and then into chondrocytes. Therefore, new cartilage is added to whatever was there before. Differentiated cartilage cells do not divide, but undifferentiated cells differentiate into cartilage cells.

The phylogenetic history of the mandible is very peculiar. The mammalian mandible is, if we may say so, a new thing. The old articulation between the reptilian mandible and the cranium has been given up and a new articulation has been formed. This process is, to speak crudely, repeated in the ontogeny of any mammalian embryo and fetus. It means simply that the mandibular articulation is not a primary contact between two bones, as for instance the elbow joint, but that the mandible, at first widely separated from the cranium, gradually grows toward the cranial base and into contact with the squama of the temporal bone. The growing cartilage at the mandibular condyle, developing within the primary undifferentiated mesenchyme of the embryo, during growth and beyond that time, is covered by connective tissue that is but a highly differentiated perichondrium that later takes over as the articulating cushion of the condyle. That fact stamps the cartilage in the mandibular condyle as something unique in the mammalian or in the human skeleton. It is unique because this cartilage grows mainly, or possibly entirely, by apposition. The cartilage in the mandibular condyle is added to by new differentiation of mesenchymal cells into cartilage cells. There is no, or possibly just occasional, mitotic division of differentiated cartilage cells.

We have to understand clearly the deep biological difference between interstitial and appositional growth of cartilage. In interstitial growth of cartilage differentiated cells divide and form new cartilaginous intercellular substance; in appositional growth of cartilage undifferentiated mesenchymal cells differentiate into cartilage cells. It is hardly possible to exaggerate the importance of this difference. Differentiation, among many other things, implies the acquisition of new enzyme systems of a cell. In mitotic division cells of a certain degree of differentiation divide. These cells before division had acquired

certain enzyme systems, and after they divide their daughter cells are, of course, in possession of the same enzyme systems. In appositional growth of cartilage undifferentiated mesenchymal cells acquire new enzyme systems that will change them into cartilage cells. They will not differentiate into fibroblasts; they differentiate along a new line of cell ancestry into chondroblasts and then chondrocytes.

If we want to understand and appreciate the difference between the proliferation of a tissue by division of differentiated cells and growth of a tissue by the differentiation of cells, we have a few very dramatic and instructive examples. For instance, in a genetic disease that leads to dwarfism, namely in chondrodystrophy, dwarfism is caused by the inability of cartilage to grow at a normal rate; in other words, cartilaginous growth is severely inhibited. However, closer scrutiny reveals that, mainly, interstitial growth of cartilage is impaired, while appositional growth of cartilage goes on almost at a normal rate of speed. This means that a dwarf of this type, as far as the skull is concerned, will show a severely shortened cranial base and, as a sequel of that, a highly vaulted forehead. The face is flat. All this is caused by the inability of the basal cartilages to grow to the full extent because these cartilages undergo only interstitial growth. Many of these dwarfs, however, show a mandible of normal size. When the mandible is too long for the deformed cranium, many of them show a mandibular prognathism.

This is true also of some breeds of dogs, for instance, the English bulldog, that genetically is characterized by a chondrodystrophy which is, peculiarly enough, restricted to the skull. The general shape of the cranium is very much the same as that of the chondrodystrophic human dwarf. It is well known that these animals are characterized by an undershot, grotesquely protruding mandible. In these cases we see that a genetic change causes a discrepancy between interstitial and appositional growth of cartilage, pointing out clearly that these two processes are of a different biological value. While in the chondrodystrophic dwarf the division of differentiated cartilaginous cells is inhibited so that cartilages which rely on that mode of growth do not and cannot grow to a normal size, appositional growth of cartilage, that is, the differentiation of mesenchymal cells into chondroblasts, is much less, if at all, inhibited.

That proliferation and differentiation are two things apart was described a long while ago by Schour when he studied the consequences of hypophysectomy on the incisor of the rat. Growth and eruption of the rat incisor rests upon the normal and equal growth of odontogenic epithelium and pulpal connective tissue at the base of this tooth. In a hypophysectomized animal, growth of the pulpal connective tissue is severely impaired and finally seems to stop altogether. Therefore, the rate of eruption decreases dramatically and finally ceases almost entirely. However, the lack of hypophyseal hormones does not affect epithelial growth. Therefore, the odontogenic epithelium keeps on growing and, since it now grows in a restricted space, it folds. The heavy folds of the odontogenic epithelium thus formed are in contact with the sluggishly growing connective tissue. The normal influence of epithelial contact with connective

tissue that leads to the differentiation of mesenchymal cells into odontoblasts is not disturbed. The cells of the connective tissue of the pulp which are now brought into contact with the cells of the folded epithelium differentiate into odontoblasts and produce folded dentin. Though the pulp has almost lost its capacity of proliferation by mitotic division of its cells, these very same cells have not lost the capacity of differentiating into cells of a different brand, that is, odontoblasts.

It is clear that in the light of these observations the mandible behaves differently from all the other bones of our skeleton, especially from the cranium itself. It therefore seems reasonable to assume that changes of the mandible are possibly, or even probably, behind many of those disharmonies that are classified as Class II or Class III, according to Angle.

There is another aspect to skeletal disproportions or disharmonies. In the mandible and in that complex of bones that constitutes the upper face, there are two most important sites of growth: in the mandible it is the cartilage in the condyle whose appositional growth determines the over-all dimensions of the mandible; in the maxilla it is the sutures that join maxilla to frontal bone, to zygomatic bone, to palatine bone, and to sphenoid bone. This complex of sutures plays the same role for the over-all dimensions of the maxillary bones as the cartilage in the condyle of the mandible plays for the over-all size of the mandible itself. But apart from any other sites of bone apposition or growth of bone tissue, there are in the maxilla as well as in the mandible sites of bone apposition that are of primary importance, namely, the free edges of the alveolar process. The total height of the maxilla or mandible is dependent not only on growth of the sutures or the condylar cartilages, but also on the growth of the alveolar processes that is simultaneous with the eruption of the teeth. These two sites of growth, sutures and condyles on one hand, alveolar processes on the other, are widely separated. Though under normal conditions there is a complete correlation between these sites of growth, this correlation sometimes may be broken. The growth of the mandibular condyle, removing, as it were, the mandibular body from the base of the skull, creates a space between maxilla and mandible into which the alveolar processes of both of these bones grow and into which upper and lower teeth erupt. However, there are many cases known in which, for some unknown reason, the alveolar processes, crudely speaking, seem not to be able to take advantage of the space that is provided for their growth and thus do not grow to their full height. Such individuals are characterized by an abnormal increase of the free-way space or interocclusal clearance. The mandibular ramus in such individuals has grown to a normal height; therefore, the elevators of the mandible, masseter, internal pterygoid, and temporal muscles have grown to their normal length, and thus the rest position of the mandibular body is normal. But since mandibular and maxillary alveolar processes have not grown to their full height, too wide a space remains between upper and lower teeth. Such individuals can be diagnosed from far away if one observes their profile at rest and in occlusion, because in occlusion their lips are pursed, and their face has a similarity to the face of an edentulous

individual. I believe that this abnormality, though sometimes casually mentioned, has not gained the necessary attention of the orthodontist, and one is tempted to add to the three classical anomalies of Angle's classification a fourth class of malocclusion, namely, the underdevelopment of alveolar processes and therefore the abnormal increase of interocclusal clearance at rest.

An example of such anomalies has been observed in acromegaly, where the mandibular condylar cartilage resumes growth and the mandible overgrows sometimes to grotesque dimensions. When this occurs, the widening interocclusal clearance leads to an increased growth of both upper and lower alveolar processes and the simultaneous overeruption of the teeth. But there have been cases in which, despite the enormous overgrowth of the mandibular ramus in height, the alveolar processes did not resume growth. Such a tremendous interocclusal clearance may develop that the individual is not able to close the jaws.

SUMMARY

1. In order to understand disharmonies of the skull in craniofacial disharmonies, one has to understand the growth mechanism both of the cranium itself and of the mandible. In the cranium, growth of the model tissue, be it cartilage or connective tissue, is the primary factor of growth. Growth of bone tissue is equally important and so is modeling resorption. While in principle the same factors hold true for the mandible, one has to realize that the growth of the model tissue, that is, the condylar cartilages, is by apposition and not, as in other parts of the skeleton, by interstitial growth. Interstitial growth means division of differentiated cells; appositional growth of cartilage means new differentiation of undifferentiated cells.

2. Biologically, the mandible behaves uniquely among all the bones of the skeleton. It is reasonable to formulate a working hypothesis stating that many craniofacial disharmonies are possibly or probably caused by alteration of mandibular growth.

3. The important leading factor in facial height is the growth of the mandibular condyle, or the growth of the mandibular ramus in height. Correlated with the condylar growth in the mandible and the sutural growth in the upper face is the growth of the alveolar process in both upper and lower jaw. A break in correlation between condylar and sutural growth on one side, and alveolar process growth on the other, leads to a particular class of malocclusion or skeletal disharmony, the development of a wide, abnormally increased, interocclusal clearance.

SERIAL EXTRACTION: PROCEDURES AND LIMITATIONS

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EVER-INCREASING interest in serial extraction has caused more than a little apprehension on the part of its advocates. From the beginning, it has been emphasized that the procedure is limited in application and is employed only in cases in which a persistent deficiency in structural development can be demonstrated. Yet, like any other concept, and in spite of these warnings, serial extraction seems to be haunted by its full quota of overenthusiastic converts. A word of caution now is necessary to stress its contraindications, as well as its possibilities, in an effort to create a bit of order out of potential chaos.

Authentic serial extraction is based on the premise that in certain types of cases the orthodontist is confronted with a continuing discrepancy between total tooth material and available arch length. In these patients, he is presented with a limited amount of basal bone in which to reposition rotated, malposed, or blocked-out teeth. His responsibility is to recognize, in the early stages, structural deficiencies that have little or no hope of responding to standard treatment procedures or to prospective growth changes.

Serial extraction, however, is not a procedure to approach with abandon, for every Class I malocclusion referred for examination at the age of 7 or 8 years is not a potential serial extraction case. Too many of these deceptive cases may be partly self-corrective if the natural forces of development are permitted to operate without interference; others can be treated successfully with a full complement of teeth. The prudent professional man discriminates between conditions which require radical treatment and those which will respond to conservative treatment procedures.

The term *serial extraction* implies the removal of selected teeth in an orderly manner over a prolonged period of time. Preliminary interception and correction in authentic discrepancy cases is accomplished in three separate stages, for three specific purposes: (1) premature extraction of the deciduous canines provides the space for the incisors to assume normal positions in an even alignment directly over basal bone; (2) subsequent extraction of the first deciduous molars permits the desirable early eruption of the first premolars; and (3) the final extraction of the first premolars makes it possible

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for the canines to erupt in a favorable direction into the spaces formerly occupied by the first premolars. Occasionally there are exceptions to this order, for each patient must be considered individually in serial extraction as well as in any other form of diagnosis.

Properly conducted, serial extraction is a procedure of patience, of preliminary supervision without mechanical therapy, and of accurate timing in the extraction sequence. It is not applied indiscriminately or in a haphazard manner; every irregularity that appears superficially to be due to a reduction in arch length is not necessarily an extraction case. The well-spaced time intervals between the various stages are designed to permit a new appraisal of the growth potential in each individual patient before the next series of extractions is undertaken. This means retaining the first premolars until the last possible moment. Once extracted, they cannot be replaced. The mystery of growth is such that no orthodontist can be too sure at too early an age.

In this manner, the orthodontist still has the opportunity of returning to ideal treatment procedures if development unaccountably turns out to be favorable. Thus, he is not irrevocably committed to one treatment method if an error in judgment has been made or if the case in question should produce an unpredictable growth spurt.

Any other course encourages unfavorable developmental risks. Even when authentic serial extraction is indicated, premature removal of teeth involves the danger of retarding future development in arches that already are deficient. Deciduous molars should be left undisturbed for as long as possible; they support the occlusion vertically as well as horizontally. Although not directly concerned with accepted serial extraction procedures, this is particularly true of the second deciduous molars, for the second premolars may be unusually slow in eruption even following the ideal natural loss of their deciduous predecessors.

In addition, premature removal of the second deciduous molars leads to a mesial migration of the first permanent molars and to the development of a close-bite, for the simple reason that the first permanent molars are required to carry the full load of mastication on the loss of the deciduous molars. To prevent these developments, the orthodontist has no choice but to place appliances for a prolonged period of years to avoid complete collapse in arch length and vertical development. Properly conducted, serial extraction requires mechanical therapy for only a few months at the end of the period of supervision.

Premature enucleation of deeply embedded premolar tooth buds at an early age is also to be condemned, as it can be accomplished only by partial destruction of the buccal or lingual plates of alveolar bone. Equally serious is the fact that continuous exposure to the forces of mastication increases the resistance of the gingival tissues to penetration by the unerupted canines and second premolars. Prolonged absence of teeth in the premolar region also permits the tongue to flow into the remaining spaces between the first molars and lateral incisors. This tongue position not only prevents eruption of the

canine and second premolar when they finally attempt to establish occlusal relations, but it also results in a major problem in habit correction during the active stages of treatment.

For these reasons, it is necessary to follow a cautious and deliberate approach to the procedure known as serial extraction. The orthodontist must recognize its limitations and he must be judicious in its application. The recommended procedure in the elusive borderline condition is first to attempt ideal treatment without extraction. If extraction later appears to be the only solution, there is no alternative except to proceed slowly, with the removal of teeth in the proper sequence and at the proper intervals. Any other course is a disservice to the patient and to the profession.

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Orthodontic Profiles

VICTOR HUGO JACKSON

> A great day is dawning in the science of orthodontia and we have chosen for our lifework a great specialty, not only of dentistry but of medicine. Our duty and responsibility to humanity are exacting. The teeth in mastication are the mill that crushes and, with saliva, mixes the food, which is the first step in the process of food digestion and any improvements in the occlusion of the teeth that can be brought about by our orthodontic treatment for that purpose would be of inestimable value to the patient.[1]

VICTOR HUGO JACKSON, born in 1850, was the seventh son of the local proprietor of the grist mill of Arcade, New York. He received his primary education in the local public schools. An early interest in dentistry was stimulated by his two older brothers, Drs. Hamilton Jackson of Detroit and Walter Jackson of Ann Arbor, Michigan. It was natural, therefore, for Victor to go to the University of Michigan, where he could spend many hours in the office with his brother while attending dental college. He was graduated from dental college in 1877. It is interesting to note that the dental course at that time was of only two years' duration, and it was possible for a dentist to acquire a medical degree with an additional one-year course of study. This Dr. Jackson did in 1888. He continued at the University for another year as an instructor and then decided to go to Europe to begin his practice and professional career. While shopping in New York City to make purchases for his European trip, he was persuaded by dental friends to open an office on 126th Street, which is now in the heart of Harlem.

Dr. Jackson soon became known in the local dental societies by giving clinics and taking part in discussions. In a short time he built a fine general dental practice, later changing his interest to orthodontics. In less than ten years after graduation from dental school he introduced a regulating appliance which he termed a "crib." Koch,[2] in his *History of Dental Surgery,* has this to say about Jackson's early work:

> In 1887, V. H. Jackson, who had previously used other appliances in regulating, introduced what he termed a "crib," designed as an anchorage attachment for plates of various kinds. It consisted of a round iridio-platinum wire bent to fit and hug both the lingual and buccal surfaces of the side or posterior teeth near their necks, with connecting wires passing between or over the occlusal surfaces of these teeth. It was designed, and at first employed, exclusively for retaining purposes, but its use was afterward extended so as to make it serve as a base for regulating devices constructed solely of wire and operating upon the spring

principle. In his practice it soon superseded the use of vulcanite plates, jackscrews and other previously used devices, and became the foundation of the system which has since been associated with his name. In appearance his crib somewhat resembled the devices of Delabarre and Schange, although those were used principally for temporarily opening the bite. The various ways in which the wire and spring idea has been carried out in the Jackson appliances are almost numberless, but in principle they consist of the bent crib for anchorage, a heavy base wire extending around the inside of the arch, to which the cribs on each side are attached and the supplementary short wires or finger springs, which exert direct force upon the teeth to be moved and which are united to the base wire. In the gradual development of the appliances the iridio-platinum wire gave way to the employment of piano-wire on account of its greater power and lesser bulk, but this has since been superseded by German silver containing a large percentage of nickel. Inasmuch as time has

Victor Hugo Jackson.

proven that the Jackson appliances in their varied forms are capable of producing any of the desired movements in regulation, and serve equally well in the matter of retention, the following claims made by the originator of the system seem to be justified:

1. Ease of construction and alteration.
2. Firm anchorage.
3. Occupation of little space in the mouth and hence least interference with speech and mastication.
4. Cleanliness; the patient being able to remove and insert the appliance.

In later years Dr. Jackson stabilized his removable appliance by the use of bands with lugs over which the wire clasps were snapped. The Jackson system of orthodontics became well known and was widely used in the profession. Many dental laboratories made Jackson removable appliances and supplied them to dentists throughout the country. Dr. Jackson gave to this group of

dentists much of his time in consultation. To give the viewpoint of a general practitioner in the use of the Jackson system of orthodontics, I quote the following from Dr. T. P. Hinman, of Atlanta, Georgia:

It seems that there are two schools of orthodontia, as there are two different schools of medicine. There are several viewpoints, that of the orthodontist and that of the general practitioner of dentistry. I have been using the Jackson appliance for a good many years and have found it to be very satisfactory. It can be used successfully along with our general work, by making the movement once a week accurately by the chart. We are not all so situated that we can send our patients to a specialist, and it may be fortunate that we are not. The Jackson appliance, if made properly, has several advantages, and one of these is that after regulating has been completed it is not necessary to spend four or five hours building a retaining appliance. The best appliance for holding the teeth in their proper alignment is the one we have used in moving them. . . . We also have the advantage of being able to thoroughly cleanse the teeth during the process of regulating.[3]

It is to Dr. Jackson's credit that he did not commercialize his ideas or appliances in any way, either through patents or through royalties from manufacturers or dealers, as was done by many in the profession in those early days. A little-known fact is that he bought, at his own personal expense, several orthodontic patents so that they would not be used to collect royalties from the public through the profession. In the preface of his book, written in 1904, Dr. Jackson said:

I freely give the results of my study to the profession. Beyond the copyright of this book, I reserve no exclusive right in the system to which I have devoted years of thought and labor. I need not rehearse the perplexities and unforeseen obstacles which are at once the bane and the fascination of scientific research. . . . How far I have succeeded in conquering the difficulties in my path let others judge. The story of man's contest with the forces of nature is as old as the world. No one is more familiar with it than members of our profession, who work to relieve their fellow-beings of the consequences sometimes of misfortune, sometimes of folly. Although no letters patent protect me in the material advantages of my system, I am not without a great reward.[4]

So that you may know the thoughts of Dr. Jackson better, I will quote the following:

It should be the purpose of the orthodontist and the general dental practitioner to recommend early treatment of irregularities of the teeth and facial deformities. For many years the writer has been earnestly recommending this early treatment. The early lateral expansion of the dental arch for the free accommodation of the permanent teeth is recommended for the purpose of improving the general occlusion of these teeth and at the same time for increasing nasal space. With his experience, he is now even more impressed that early orthodontic and orthopedia treatment should be undertaken in cases having faulty development of the bony framework affecting the dental arches and the nasal organs.[5]

In marked distinction to many authorities of his day, Dr. Jackson spoke out in regard to extraction of teeth as an aid to orthodontic treatment as follows:

I maintain, and a considerable number agree with me, that there are occasionally cases where extraction is required to bring about the best final result. In the treatment of some cases of extreme double protrusion of the teeth and jaws, where it is hereditary, and where there is what some would call normal occlusion, the operator is at fault if he does not extract. Our duty as orthodontists is not only to bring about typical occlusion of the teeth, but to improve the facial contour.[6]

In the light of present-day treatment procedures, let us observe what Dr. Jackson said and illustrated in his book, which was written in 1904:

In Figure 469 are shown the features of Miss M., aged fourteen, a case of double protrusion regulated in 1896. The teeth of both the upper and lower arch were overcrowded, the incisors being much too prominent, with upper incisors rotated and resting on

Figure 469 from Jackson: Orthodontia and Orthopedia of the Face, Philadelphia, 1904, J. B. Lippincott Company.

Figure 472 from Jackson: Orthodontia and Orthopedia of the Face, Philadelphia, 1904, J. B. Lippincott Company.

Figure 476 from Jackson: Orthodontia and Orthopedia of the Face, Philadelphia, 1904, J. B. Lippincott Company.

the lower lip, giving the mouth a full and unpleasant expression. Each arch was sufficiently broad and expansion was not practical. It was therefore necessary to extract a tooth on either side of both the upper and lower arches.[7]

These illustrations show the treatment of double maxillary protrusion by extraction, headgear, etc., before the turn of the century. The beautifully made plaster masks show the excellent results obtained by Dr. Jackson.

Dr. Eby, in discussing one of Dr. Jackson's papers presented in 1921,[8] gave the following as advantages of the Jackson appliances.

> Our present knowledge of the correct control of tissue changes in physiological processes attending tooth movement by mechanical stimulation has substantiated the active principle which Dr. Jackson recognized in his first efforts to produce an apparatus employing the accurately measured liberation of spring and elastic forces.

Later on, in the same discussion, Dr. Eby also stated:

> In the Jackson apparatus, the side arms or the extended finger springs may be made to engage groups of teeth so as to transpose them en masse, or block movement, some of the following facts are suggested: (1) Movement expedited. (2) Teeth retain alignment. (3) Peridental membrane, etc., uninjured. (4) Retention more rapid and assured.

For a man with a busy private practice, Dr. Jackson was generous in the time he devoted to teaching both dental students and dentists. Among his early teaching efforts was the Section of Orthodontia of the First District Dental Society of New York, a class he conducted for years. He became a lecturer and later a professor of orthodontics at the University of Buffalo. He was a special lecturer at the Forsythe Dental Infirmary in Boston. He was a lecturer in orthodontia at the College of Dentistry and Oral Surgery of New York (now connected with Columbia University), and also at Pennsylvania College of Dental Surgery in Philadelphia. He was clinical professor at the College of Dentistry of New York University. Dr. Jackson was a member of the faculty of the Dewey School of Orthodontia, as well as a consultant at the National Hospital for Speech Disorders.

Distinct honors came to Dr. Jackson from institutions of higher learning. In 1914 the University of Michigan bestowed an honorary M.A. degree upon him in recognition of his many contributions to orthodontics. The University of Buffalo dedicated the Victor Hugo Jackson Clinic in 1920 as a tribute to his success and work. He was elected a Fellow of the American College of Dentists.

Dr. Jackson maintained, throughout his life, a great interest in his alma mater. He made a life-sized bust of Dr. Jonathan Taft, Dean of the Dental College. This was later cast in bronze and presented to the University of Michigan on behalf of the Alumni Association.

Dr. Jackson was a great and true supporter of dental organizations. He believed in them and freely gave of his time and talents. He worked for the highest ideals of professional life and ethics. He had the unique distinction of serving on the Executive Committee of the American Dental Association for twenty-three years, without interruption, from 1890 to 1913. He was president of the First District Dental Society of New York in 1894, and was an honorary member of the Second District Dental Society. He was a member of many dental and medical societies here and abroad, including the European Orthodontological Society, New York Institute of Stomatology, International Association of Dental Research, and New York Odontological Society. He was a Founder

of the New York Society of Orthodontists (now the Northeastern Section of the A.A.O.), an early member of the American Society of Orthodontists, a Fellow of the New York Academy of Medicine, American Medical Association, and Harlem Medical Association. He was made a life member of the Delta Sigma Delta dental fraternity. In 1916 he received the Jarvie Gold Medal from the Dental Society of the State of New York, its highest award and a very great honor.

Besides giving many clinics and papers in this country, Dr. Jackson appeared before and participated in many important dental and medical congresses, among which were the following: The Second World's Columbian Dental Congress, Chicago, 1893; Third International Dental Congress, Paris, 1900; Honorary Vice-President of the Fourth International Dental Congress, St. Louis, 1904; Honorary President, Section of Orthodontia at the Fifth International Dental Congress, Berlin, 1909; Sixth International Dental Congress, London, 1914; Vice-President of the Panama Pacific Dental Congress, San Francisco, 1915; Honorary President of the First International Orthodontic Congress, New York, 1926; Ninth International Medical Congress, Washington, 1887; Tenth International Medical Congress, Paris, 1900; Sixteenth International Medical Congress, Budapest, 1909.

At the Dental Congress in London, 1914, Dr. Jackson presented the advantages of the removable type of orthodontic appliances and Dr. Herbert Pullen of Buffalo presented the advantages of the fixed type of orthodontic appliances. It was a debate that aroused much interest, for the profession was divided on this subject.

At the close of the London Congress, Dr. Jackson went to Central Europe to give clinics to dental groups. While he was there, World War I broke out and it was with great difficulty, and perhaps good fortune, that he was able to get out of Europe and return on the last ship bringing Americans back to this country.

In 1913 when he began to limit his practice to orthodontics, Dr. Jackson moved to a large, beautiful office in a very fine exclusive Professional Building at 40 East 41st Street, New York City, said to be the first medical building in the country. Here he generally had a staff of two young professional men to assist him. Thus he had much free time to devote to both original work and consultations. This arrangement also provided valuable training and experience for these men wanting to enter the practice of orthodontics, and it was in this capacity that, after graduation, I worked and lived with Dr. Jackson for over two years. It may interest the younger men in our profession to know that it was Dr. Jackson's custom to set a flat fee for the treatment of each case, which was, with few exceptions, more than $1,000.00, and that it was his custom to collect $700.00 for treatment during the first year.

Dr. Jackson was a bachelor. He never seemed to have time or allow himself the time for the usual social hours in life. He always refused invitations to visit his acquaintances in their homes or at social gatherings. However, he was by nature a joiner and was inclined to join organizations and clubs just to

attend the formal dinners and programs. He loved after-dinner speeches given by prominent people of his time, but never went to the theatre, opera, or concerts.

He was generous in supporting local organizations with noble purposes, such as the New York Peace Society, National Parks Association, National Historical Society, Navy League of America, Merchants Association of New York, China Society of America, New York Zoological Society, Metropolitan Museum of Art, American Museum of Natural History, and Horse Aid Society. Dr. Jackson was very fond of horses and seldom passed a horse on the street without stopping to pet and feed him lumps of sugar, which he almost always carried in his pocket. Among his papers was found a note which he had apparently planned to include in a will, leaving $10,000.00 to the Horse Aid Society for the care of sick horses.

Organizations of a social nature to which he belonged included the Lotus Club, New York Athletic Club, Graduates Club, University of Michigan Alumni Club of New York, and The S.A.R. He belonged to some clubs even though he did not go to their functions or use their facilities. For example, he joined and remained a member for years of the Rockwood Hall Country Club on the Hudson River, yet he continued to arise at the break of dawn on Sunday mornings to play golf on the public courses of New York City.

Dr. Jackson always enjoyed his work and was blessed with good health. He was not one of those who thought of retiring. When he was 77 years old he planned a new office and took a long lease in a new professional building. It was in the hospital of this building that he died of pneumonia, after a very short illness, in January, 1929.

Dr. Jackson had accumulated a rather large fortune for a professional man (in those days), and had made notes of his desire to leave $150,000.00 to the University of Michigan, an almost equal sum to the University of Buffalo, and smaller bequests to other philanthropic organizations. However, these institutions did not receive these amounts, as Dr. Jackson had not made out a legal will.

Dr. Jackson will always be recognized as the leading advocate, in his day, of the use of removable appliances in orthodontics. In addition, and equally important, he will be remembered as the early advocate of continuous spring pressures in orthodontic treatment, in contrast to intermittent pressures.

Koch's *History of Dental Surgery* contributes the following with respect to Dr. Jackson's stature in orthodontics:

> Dr. Jackson was one of the early advocates of continuous pressure in preference to intermittent pressure so strongly advocated by Dr. Farrar. Using the springiness of metals as his sole source of power, Dr. Jackson's methods are in strong contrast to those of all other prominent orthodontists, most of whom avail themselves of a variety of power-producing appliances. In another respect also, Dr. Jackson stands out in contrast with his fellow specialists. While the question of the relative advantages of removable and non-removable appliances has been discussed for many years, with the great bulk of opinion strongly favoring the latter, Dr. Jackson has consistently held from the first that the removable appliance is the only one that can assure cleanliness and freedom from tooth-injury and that in the

case of retaining appliances these features are of the utmost importance. In 1904, Dr. Jackson published his book, entitled "Orthodontia," containing a full exposition of his system and methods from the beginning of his work down to the date of publication.[9]

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—*Walter Coolidge Chapin.*

Editorials

ELIGIBILITY REQUIREMENTS FOR MEMBERSHIP IN THE AMERICAN ASSOCIATION OF ORTHODONTISTS

JUDGING from letters regarding eligibility requirements for active membership in the A.A.O., some readers are not clear on the changes that were made at the May, 1957, meeting of the American Association of Orthodontists in New Orleans.

Action taken at that meeting now limits eligibility to one of two combinations of requirements:

The first set of requirements means that he who desires to join the American Association of Orthodontists must have had not less than five years in the exclusive practice of orthodontics and, in addition to that, he must have successfully completed an orthodontic course of a minimum of 1,500 hours in an approved dental school. (As of this date the Council on Dental Education of the A.D.A. has made no official survey or specific recommendations as to the standardization of graduate orthodontic schools.)

Another set of conditions pertaining to preceptorships provides that an applicant must have five years in the exclusive practice of orthodontics, at least three consecutive years of which shall have been in the office of, and in full-time association with, a practicing member of the American Association of Orthodontists. This practicing member shall have been an active member of the American Association of Orthodontists for not less than eight years.

The Admissions Committee of the American Association of Orthodontists explained the above conditions as follows:

1. These requirements became effective as of May 16, 1957, for the establishment of any new associate-training program by any member of the American Association of Orthodontists.

2. University training must meet the qualifications of 1,500 hours.

3. Associate-trained applicants may qualify under the former eligibility requirements, provided that they become eligible and make application for active membership previous to the next regular meeting of the A.A.O.

The formal report of the Admissions Committee of the American Association of Orthodontists appears on page 701 of this issue of the JOURNAL.

H. C. P.

A REPORTER'S VIEW OF WHAT HAPPENED AT NEW ORLEANS WITH RESPECT TO MEMBERSHIP REQUIREMENTS

AT THE Tuesday business meeting the matter of amending the By-Laws concerning membership after preceptorship training came up as scheduled. On request, Dr. Oren A. Oliver read the entire amendment. Then Dr. Edgar D. Baker, Chairman, read the A.A.O. Admissions Committee recommendation. Next, Dr. Broussard asked for discussion, and no one spoke for or against! Dr. Broussard then called for a voice vote which was indefinite, as was the second voice vote. Then a standing vote was taken, but it was indecisive. Finally, a secret ballot was taken, amid considerable confusion about the question before the house.

The Directors acted as tellers and the vote was 189 against and 186 for the amendment. This meant that the new amendment providing for associateship was defeated and the 1,500-hour university training amendment passed in San Francisco would become effective at the meeting. Promptly after this vote was announced, Dr. Oren A. Oliver was recognized, followed by Lourie Porter, Stephen Hopkins, Ed Arnold, Howard Yost, and others. They made various points that added up to one and the same thought, namely, that if the A.A.O. in making this move is in reality restricting its membership requirements so sharply the end result is sure to be further subdivision of the A.A.O.

The question was raised as to how soon this 1,500-hour amendment would become effective—whether immediately or after a few months' wait for the various component societies to process those men who were eligible under the old membership requirements.

Dr. Pasternak, President of the Orthodontic Alumni Society of Columbia University, said that the Columbia group felt that every applicant for active membership in component societies and the A.A.O. should fulfill the 1,500-hour university training requirement as the By-Laws now required. He was followed by Dr. Born of the Southwestern Society, and Dr. Hopkins of Washington, and Dr. Graber of Chicago, who suggested that the 1,500-hour membership requirement be not made immediately effective. Dr. Spengeman, Secretary of the Columbia University Alumni Society, said that their group would not like to see anyone penalized and would agree to extending the time.

A motion was finally made and passed to the effect that each component society could continue to process future members under the old membership requirements until their next annual meeting. This carried and the meeting was recessed to Thursday.

On Thursday Dr. Howard Strange of Chicago asked for a reconsideration of the question. Drs. Porter, Eby, Alstadt, Williams, and Margolis all spoke in favor of a reconsideration of the amendment and in favor of the amendment.

Dr. Spengeman questioned the legality of the reconsideration and it was pointed out by Dr. Philip E. Adams, the official parliamentarian (who read quotations from Robert's *Rules of Order*), that the action was entirely legal and

clear according to Robert's *Rules*. Then Dr. Graber of Chicago said that it seemed to him that the proceedings were legal. Finally, a vote by secret ballot was called.

The vote was carefully tallied, each member going up single file, showing his folded ballot to the ballot box keeper, and then depositing same. A tally was kept as to the number of members who voted. The reconsideration was adopted by a vote of 159 to 42.

No secret ballot was requested then on the vote on the original amendment, so the amendment was then adopted by voice vote, with no dissenting votes. So ended the 1957 vote on the question of who may or may not be eligible for membership in the A.A.O. in the years to come.

There can be no question as to the sincerity of purpose of those on each side of this much debated and important question. To one with a "ring-side seat," it seemed that the basic viewpoints of the two groups were very far apart. One group was thinking in terms of harm to the specialty in the eyes of the public, Government agencies, and the medical and dental professions, to whom the 1,500-hour restricted membership rules appear to reflect intolerance or undemocratic concepts. The second group was obviously thinking in terms of discouraging "quickie" entrance to the A.A.O. through the back door by those who are untrained in orthodontics and who gain prestige by membership.

It is to be hoped that the strict policing of preceptorship training, the standardization of school training, and equal standardization of the competency of teachers will provide a satisfactory answer to both groups.

One thing is certain: Both groups see eye-to-eye on the proposition that the untrained and incompetent should not be welcomed into membership in the American Association of Orthodontists, and that they should seek careful training and then make application for membership.

H. C. P.

EFFECT OF POSTADOLESCENT FACE GROWTH ON ORTHODONTIC RESULTS

EXTRACTION of teeth as a means of obtaining better dental arch alignment and improvement of the facial profile now is almost universally accepted procedure in orthodontics. The theory is advanced that, by moving or "uprighting" the mandibular incisors to an established angular relationship with the mandibular plane or with the Frankfort plane, we cannot only obtain more stable results in dental arch alignment, but we can also "improve" thereby the facial profile by reducing alveolodental prognathism. The foregoing had been found to be impossible of accomplishment where there was crowding of the teeth or where the dentition was situated in labial relation to the respective bodies of the maxilla and mandible which, with procumbent mandibular incisors, is the prime cause of alveolodental prognathism.

Many cases of collapse of mandibular incisors and failure of the facial profile to show "improvement" were noted, however, in posttreatment observation of patients who had experienced a reduction of teeth in their dental arches and whose orthodontic treatment was scrupulously performed, especially with regard to moving or maintaining their mandibular incisors on "basal bone."

We have previously[1] called attention to the fact that collapse of mandibular incisors in orthodontically treated dentitions, regardless of whether or not extraction was part of treatment, was frequently unrelated to the quality of the orthodontic therapy experienced by the patient. One of the main reasons for mandibular incisor collapse is the practice of occlusal mannerisms by the patient undergoing total personality changes during the adolescent period. These mannerisms express themselves in untoward stresses exerted on the mandibular incisors which finally move them out of the orthodontically achieved regular alignment.

Björk and Palling[2] have shown that the axial position of the incisors undergoes change during adolescence. This change shows itself, on an average, in a more vertical relationship of these teeth to the mandibular base, with a resultant tendency to incisor crowding. However, Björk and Palling found also that many compensating changes are to be observed in incisor angulation, some showing increased procumbency while others maintain their original angular relationship.

We have enumerated elsewhere[3] additional factors which can affect the facial profile, besides the angular relationship of the incisors to each other and of the mandibular incisors to the base of the mandible. We must take into consideration, for example, the thickness of the soft tissues covering the face, especially the thickness, tonicity, and habitual position of the lips. In addition, it appears that the size of the nose is also an important factor in the appearance of the facial profile, and we have demonstrated the striking facial changes, including the straightening of the profile following rhinoplasty.

Baer,[4] writing on dimensional changes in the human head and face in the third decade of life, cites studies by Hrdlička, Hellman, Hooton and Dupertuis, Buchi, and others which show that the human face and profile continue to change in their dimensions throughout life and into senility.

Baer found male total face height, nose height, and bizygomatic width to show significant size increases during the third decade of life. This is especially true in the male. At the same time, head length, head breadth, and head circumference do not significantly change with age. The fact remains that research evidence points to the fact that the facial profile continues to change well past the adolescent period.

With the foregoing being the case, it would appear that attempts to produce lasting changes in the facial profile by changing the angular relationship of the incisor teeth are subject to many modifications which continue to influence the final result. The above opens a new field for additional studies in

facial growth changes, especially the influence of the soft tissues on the appearance of the facial profile. At present we know less about soft tissue influence on facial appearance and alveolodental prognathism than about any of the other craniofacial components. The conclusion to be drawn is that orthodontic treatment performed up to the early teen-age period which seeks to "improve" the facial profile by orthodontic means, whether extraction is a part of the therapy or not, is not only beset by many uncertainties, but, more likely than not, will prove disappointing.

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J. A. S.

Reports

REPORT OF THE ADMISSIONS COMMITTEE, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

RECOMMENDED RESOLUTIONS

1. Each constituent and/or component society of the A.A.O. shall have active and associate memberships and may have other types, provided that they are compatible with those authorized in the Bylaws of the A.A.O. (Chapt. XIV, Sec. 7).

2. Each constituent and/or component society of the A.A.O. shall have a Board of Censors or similar committee of sufficient number which shall evaluate the qualifications for membership and report their recommendations to the respective society.

3. In evaluating the qualifications for membership of an applicant, the Board of Censors or similar committee shall satisfy itself that the applicant possesses the necessary knowledge both mechanical and biologic, to render competent orthodontic service.

4. The standards of eligibility for active and associate membership (as provided in Chapters I and XIV) in the constituent and/or component society shall be those provided in the Bylaws of the American Association of Orthodontists.

5. An associate member of a constituent and/or component society, upon becoming eligible for active membership, shall make application for same. The secretary of the constituent and/or component society shall notify the associate member one year previous to his becoming eligible for active membership. Associate membership shall automatically terminate one year after eligibility for active membership is reached.

The Admissions Committee further recommends that the following suggestions relative to improving admissions policy be transmitted by the secretary of the A.A.O. to the constituent and/or component societies for their information and guidance:

1. Uniform application blanks to be furnished.

2. Two endorsers (active members) in the applicant's locality.

3. Letters of endorsement from endorsers, one of which must contain a current appraisal of the applicant's practice based upon actual knowledge and observation (office visit preferable).

4. The applications of applicants which have had preliminary approval by the Board of Censors or similar committees to be published and sent to the active members of the

Society sufficiently in advance of the meeting at which the applications are to be acted upon to allow the membership to submit information to the Board of Censors relative to the applicants and to allow the Board of Censors to evaluate the information.

5. Personal interview with the applicant, the Board of Censors or similar committee (written or oral examination, a thesis, or case reports may be required).

6. The constituent societies shall develop a program of study for the guidance of the senior associate (preceptor) in conformity with current orthodontic educational methods. The constituent societies shall be responsible for the development of mechanisms to assure that the provisions of associate training are being carried out.

7. In the event of the absence of the senior associate due to illness or other circumstances which interrupt the training program of the junior associate, the Board of Censors or similar committee of the constituent or component society may extend the time of the associateship to meet the A.A.O. eligibility requirements.

8. Formal introduction of new members at the meeting with charges of responsibility and signing and/or administration of pledge. (The Pacific Coast Society has a very fine new members' pledge.)

9. Periodic survey of men practicing orthodontics within the area of the constituent society with the thought of encouraging membership for likely candidates.

The Committee further recommends that the Admissions Committee be continued and that it act as a clearing house for suggestions from the constituent societies in relation to perfecting the rules for admission at the constituent society level, and report their recommendations to the A.A.O. at its next annual meeting.

Respectfully submitted,

LYNDON CARMAN
GEORGE C. TURNER
P. M. DUNN
HARLOW SHEHAN
GEORGE ANDERSON
NORMAN HILLYER
FRANK HEIMLICH
E. D. BAKER, Chairman.

REPORT OF THE HISTORIAN, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

THE plan suggested by your Historian and approved by the Board of Directors at the fifty-second annual meeting has been followed.

The usual questionnaire was sent to Past-president Adams, who filled it in and returned it promptly. He outlined in detail what he considered the outstanding presentations and filed a program of the meeting with the notable contributions checked, thus complying fully with the request of the Historian. He also sent an enlarged glossy print of his favorite photograph. A negative, 3¼ by 4¼ inches, a glossy print, and a lantern slide were made and the latter was retouched in color. This was also done with a new slide of George R. Moore made to conform with those of the other past presidents.

All of this record is being sent to the Librarian for safe storage in the archives of the Association.

The budget of $75.00 has been only partly used. It is felt that the sum of $25.00 will be adequate for the coming year. Therefore, it is requested that this amount be provided in the budget for the next year.

Respectfully submitted,

L. M. WAUGH, Historian.

April 15, 1957.

REPORT OF LIBRARIAN, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

SINCE my last annual report, Dr. B. W. Weinberger donated the following material, which has been placed in our library:

One pamphlet: *Eighteen Years of the American Society of Orthodontists.*

Nine booklets: *Constitution and By-Laws of A.A.O.,* dated 1901, 1906, 1912, 1918, 1922, 1928, 1932, 1940, and 1949.

Eleven booklets: *American Board of Orthodontics,* dated 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1947, 1949, and 1954-1955.

Secretary Franklin A. Squires furnished microfilms of A.A.O. minutes covering 1946 to 1955, inclusive.

Secretary Earl E. Shepard furnished microfilms of A.A.O. minutes for the 1956 session.

I was able to add the following photographic prints to our historical collection:

Two prints: Presidents of the A.A.O., 1901 to 1929.

One print: Twenty past-presidents of the A.A.O. (photograph taken at the Chicago session in 1954).

I received the following listed lantern slides from our Historian, Dr. Leuman M. Waugh:

Individual slides of the first fifty past-presidents of A.A.O., including 1955.

Group: Members at the first A.A.O. meeting.

Group: Members at the 1928 meeting in Buffalo, New York.

Group: Presidents during the second twenty-five years of the A.A.O.

A bound volume (1956) of THE AMERICAN JOURNAL OF ORTHODONTICS has been added to our library.

The attached sheet carries a list of all the material in our bookcase in the A.D.A. library in Chicago.

Respectfully submitted,

CHARLES R. BAKER, Librarian.

The following material is kept in a locked cabinet in the library of the American Dental Association, Chicago, Illinois:

Complete records of published proceedings of A.A.O.

One bound volume: *First Inter-American Orthodontic Congress.* Spanish translation. (This covers 1942 session.)

Two pamphlets: *Eighteen Years of the American Society of Orthodontists,* by B. W. Weinberger.

Three reprints: "The American Association of Orthodontists—Covering the First Half Century," by Leuman M. Waugh.

One letter-press book containing copies of letters written by the secretaries, 1902 to 1905.

Nine booklets: *Constitution and By-Laws of A.A.O.,* 1901, 1906, 1912, 1918, 1922, 1928, 1932, 1940, and 1949.

Eleven booklets: *American Board of Orthodontics,* 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1947, 1949, 1954-55.

Microfilms: A.A.O. minutes:

One roll covering June, 1901, to April 11, 1930.
One roll covering April 21, 1931, to Oct. 2, 1946.
One roll covering 1946 to 1955, inclusive.
One roll covering 1956 session.

Photographs: Two prints of Presidents of the A.A.O., 1901-1929; one print of twenty past-presidents of the A.A.O. taken at the Chicago session, 1954.

Lantern slides received from Historian: The first fifty past-presidents, including 1955.
Group: Members at the first meeting of the A.A.O.
Group: Members at the 1928 meeting in Buffalo, New York.
Group: Presidents during the second twenty-five years.

REPORT OF THE MILITARY AFFAIRS COMMITTEE, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

THE Military Affairs Committee is pleased to report that the situation with regard to the demands of the Armed Forces upon the members of the American Association of Orthodontists has reached a most satisfactory status. In brief, it is now apparent that the requirements for dental officers are being met amply by new graduates from the dental schools.

As was predicted by this Committee last year, there is little likelihood of any claim being made upon the services of the Association's membership so long as the international situation remains relatively quiet. The Selective Service System itself has been noticeably reluctant in the past to induct dentists

over the age of 40 unless there was no other source from which to complete the requirement for replacements which the supply of new graduates was inadequate to fulfill. In the last several years a few of our members in the Priority III group have been summoned to active service on this basis. However, indications now are that this state of affairs no longer exists. The newer members of the Association who were eligible for military service have already discharged that debt to our country. The great majority of the others saw duty during World War II; the few who did not are included in Priority III, and they are rapidly passing the age limit as the years go by.

That the new graduates from the dental schools will be sufficient in number to fill the replacement quota in the future is indicated by a report recently issued by the Defense Department. The results of a survey submitted to the Defense Department by the American Dental Association's Council on Dental Services and Council on Dental Education show a total of 2,081 seniors probably liable for military service, whereas the Armed Forces request 1,642. Thus, a surplus of 439 (or, roughly, 25 per cent) should provide a comfortable margin to answer virtually any foreseeable eventuality short of hostilities. This evidence, moreover, should be most valuable in support of the A.D.A.'s opposition to the re-enactment of the so-called doctor-draft law. Passage of this legislation is not even being pressed by the Selective Service officials, and it is sincerely hoped that the need for such a law will never again arise. If, however, Congress should see fit to pass a new law of this type, it seems certain that the final version would be so watered down that the upper age limit for dentists would be proportionately similar to the draftees in lay groups. In other words, very few beyond the general age bracket of dental students would be eligible.

This year the Military Affairs Committee has received no requests for assistance or information and no complaints from the members of the A.A.O. which might require action. Hence, no business has been transacted and no meetings have been necessary.

Respectfully submitted,

Hugh A. Sims
William H. Oliver
William A. Flesher
Paul V. Reid
D. Robert Swinehart, Chairman.

April 8, 1957.

REPORT OF THE PROGRAM COMMITTEE, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

THE official program is sufficiently informative as to the scientific program to make further comment unnecessary.

The informative pamphlet accompanying the official program is an innovation. It concentrates important data, lessening the great detail usually found

in the official program booklet. We believe that this pamphlet makes for easier reading and comprehension. It also allows for earlier printing which relieves the last-minute turmoil incident to bringing out the final program.

The scientific program expense has been kept within the $2,000.00 budget allotment. If the committee drafting the program manual does not recommend an increased budget allotment and a re-evaluation of the formula for payment of expenses under which the Program Committee operates, we recommend that these two things be done, for the present formula is too restrictive. A more realistic approach to cover the costs and the remuneration of contributors in this expensive era is needed to produce well-rounded and progressive scientific programs for this Association.

William S. Brandhorst
W. Paul Hoffman
Arnold Stoller
H. K. Terry
George M. Anderson, Chairman
W. Alton Moore, Research
John Thompson, 1958
Scott Holmes, 1959.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

THE Committee is continuing conferences with the American Public Health Association, with the Division on Dental Resources of the United States Public Health Service, and with the Division of Dental Public Health of the United States Public Health Service, on drafting a questionnaire and on the agencies and persons to whom the questionnaire is to be directed. The aid of the foregoing agencies is being requested also in the interpretation of the questionnaire.

The Committee recommends (1) that the aforementioned negotiations be continued, (2) that the questionnaire be submitted to the Board of Directors of the American Association of Orthodontists for its approval, and (3) that the appropriation that was not used during the past year be continued.

Respectfully submitted,

L. Bodine Higley
Stephen C. Hopkins
Herbert K. Cooper
Oren A. Oliver
J. A. Salzmann, Chairman.

REPORT OF THE PUBLIC RELATIONS COMMITTEE, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

TWO members of the American Association of Orthodontists participated formally in a public hearing on "Trade Practice Rules for the Commercial Dental Laboratory" which was conducted by the Federal Trade Commission in Chicago, Illinois, on Feb. 4, 1957. Both members appeared as official representatives of the American Dental Association. Dr. John R. Thompson, professor of orthodontics at the School of Dentistry, Northwestern University, Chicago, was one of the five official witnesses. Dr. Frederick R. Aldrich, of Columbus, Ohio, chairman of the Public Relations Committee of the A.A.O., served as special consultant to the A.D.A. witnesses during the hearing.

Commissioner Robert T. Secrest of the Federal Trade Commission presided. There were seventeen witnesses in all.

The hearing was held at the request of the American Dental Association, which formally presented its request for amendment of the "Trade Practice Rules." The "Rules" were issued by the Federal Trade Commission in November, 1955, at the request of the National Association of Dental Laboratories.

Dr. Harry Lyons, of Richmond, Virginia, president of the American Dental Association, told Commissioner Secrest that "the American Dental Association will vigorously protest the continuation of the 'Rules' in their present form and will regard as equally objectionable modified 'Rules' which do not accurately reflect the limitations imposed by state dental laws on the function of commercial dental laboratories."

The objectives sought by the Association were summarized by A.D.A. counsel at the hearing as follows: (1) that the definition of the commercial dental laboratory industry be extended to all those manufacturing dental appliances except licensed practicing dentists and their office personnel, (2) that the terms *design* and *occlusion* be eliminated from the "Rules" and that the relationship between dentists and technicians be clearly identified in the "Rules," (3) that the portions of the "Rules" be eliminated which deal with advertising or promotional allowances, discriminatory services, and exclusive deals as having "no meaningful application to transactions to which a dentist is a party," and (4) that the jurisdiction of the "Rules" be expanded to include both ethical and non-ethical segments of the dental laboratory industry.

Dr. Thompson discussed the "Rules" as they relate to orthodontics. He also joined with Dr. Aldrich in a general review of official Association testimony presented at the hearing.

It is expected that the Federal Trade Commission will announce its decision on the request of the American Dental Association in May or June.

The National Association of Dental Laboratories joined with the American Dental Association in proposing that the "Rules" be modified. It also suggested some different terminology than that proposed by the A.D.A.

In addition to Dr. Lyons and Dr. Thompson, officials for the Association included Dr. Walter E. Dundon, of Chicago, chairman of the A.D.A. Council

on Dental Trade and Laboratory Relations; Dr. Raymond J. Nagle, dean, College of Dentistry, New York University; and Dr. J. Eugene Ziegler, of Los Angeles, director of the School of Dental Laboratory Technicians, University of California. Mr. Renah Camalier, of Washington, D. C., was special counsel to the Association.

EUGENE J. KELLY
FRANK P. BOWYER
FREDERICK R. ALDRICH, Chairman.

REPORT OF THE RESEARCH COMMITTEE, AMERICAN ASSOCIATION OF ORTHODONTISTS, 1957

FOR the past several years this Committee has directed its attention to two main functions: (1) the conducting of an annual prize essay competition and (2) the arranging of a Research Section for the annual meeting of the Association. The present meeting marks the twelfth prize essay competition and the tenth Research Section meeting.

This year, as in the past, notices of both the essay contest and the Research Section meeting were printed in the *Journal of the American Dental Association* and the AMERICAN JOURNAL OF ORTHODONTICS. Announcements and requests for research reports for the Research Section were also sent to all the schools of dentistry of the United States and Canada. Mimeographed research forms were included with the announcements and letters to the various schools. Eleven entries were received for the research contest, and the quality of the entries was very high. The Committee also received thirty-two abstracts of research to be reported at the Research Section during this meeting. Seventeen of these authors indicated that they would be present in person to present their research findings. This is a very gratifying response and indicates that the Research Section of the meeting has definitely come of age. Some apprehension had been expressed as to whether or not the research portion of the meeting would draw very many participants with the meeting being held in a city which is not in close proximity to dental schools with graduate programs in orthodontics. The response to the Committee's request for research reports this year clearly indicates that we should no longer be apprehensive about the availability of material for the research portion of the meeting.

The eleven entries for the research essay award were received in the manner prescribed in the official announcement which appeared in the JOURNAL. The five members of the Committee served as judges, and we are happy to report very close uniformity of opinion in the judging this year. The results of the judging were as follows:

First Prize: Samuel Pruzansky, D.D.S., M.S., and Edward F. Lis, M.D., Chicago, Illinois.

"Cephalometric Roentgenography of Infants: Sedation, Instrumentation, and Research."

First Honorable Mention: Edgard F. Debbane, D.C.D., Rochester, New York.
"A Cephalometric and Histological Study of the Effect of Orthodontic Expansion on the Midpalatal Suture of the Cat."

Second Honorable Mention: Robert J. Huettner, D.D.S., M.S., and Clifford L. Whitman, D.D.S., New York, New York.
"Tissue Changes Occurring During Orthodontic Movement in the Macacus Rhesus Monkey."

A number of other excellent papers have been presented and the Committee recommended to several of the authors that they be prepared for publication because of their potential worth to our literature. Drs. Pruzansky and Lis have been notified that they are the winners of the $500.00 prize, and have been invited to attend this meeting to present their paper. The first three papers become the property of the Association, so far as publication rights are concerned, and have been forwarded to the editor of the JOURNAL. The Committee this year also invited the two honorable mention recipients to attend the Research Section, and allotted fifteen minutes for each to present an abstract of his research findings. Both of these recipients accepted this invitation.

Several other activities have engaged your Committee's time this year and, in order to conserve space, are reported briefly here. The first of these activities concerns the implementation of an action authorized by the Board of Directors in 1954. In 1953 Dr. Robert E. Moyers, in his committee report, requested that a sum of money be made available to the Committee for the design and printing of suitable certificates to be presented to the past and current recipients of the prize essay award as well as those receiving honorable mention. In 1954, Dr. John R. Thompson requested in his committee report that a sum of money be set aside for this purpose. He estimated that the initial expense for such certificates would not exceed $200.00. He also estimated a yearly expense of not more than $25.00 to continue this procedure. This recommendation was approved by the Board of Directors in 1954. The Committee this year, under the authority granted by the 1954 Board of Directors, has had suitable certificates designed and prepared for all past recipients of the awards, as well as for the current award winners. At the time of the writing of this report a cost accounting of the preparation of these certificates is not available as all the charges are not in. It can be said, however, that the cost will fall within the estimate made by Dr. Thompson at the time the authority was granted. In order to carry out this activity, it was necessary to make a thorough search of our JOURNAL for the names of the past recipients. In doing this, the chairman developed a fairly complete concept of the history of the Research Committee of the Association. For the benefit of posterity, and to aid future members of the Committee, a brief historical review of the Committee's activities, as well as a detailed accounting of the Committee's present distribution of duties and method of operation, is being prepared.

The Committee had one problem this year which it solved without difficulty, but with some embarrassment. It is a problem with which the Board of Directors are well aware and equally concerned. The only solution appears to be that the Association in the future check carefully into hotel regulations that might make it impossible for any of our members to attend the scientific sessions of the Association.

As for recommendations, your Committee has only one to make for this year. This recommendation concerns the length of time allotted to the Research Section portion of the meeting, as well as the day on which it is held. As pointed out previously in this report, thirty-two research abstracts were submitted with seventeen authors requesting time for presentation. In the past few years a ten-minute limitation was placed upon each participant in the Research Section. If each of the seventeen reports takes ten minutes, it will require three hours' time. To this must be added one hour for the reading of the prize essay and fifteen minutes for each of the honorable mention recipients. Thus, this year's program would require four and one-half hours for its completion. The Program Committee has allotted three hours of the regular program time to the Research Committee for the holding of the Research Section. In this schedule it should also be pointed out that there would be a complete lack of time for discussion and questions from the audience.

Interest in the Research Section is growing annually and the Committee is becoming concerned with regard to the growing need for more time for conducting the Research Section. With these thoughts in mind, the Committee respectfully submits to the Board of Directors for their consideration a possible solution to this problem. It may be approved for a one- or two-year trial period and then re-evaluated at that time. Four of the five members of the Committee accept this recommendation and the fifth member is in general agreement but has some reservations concerning it. Since it is the purpose of the Research Committee to foster and stimulate research in orthodontics, and since the time required to handle a research section adequately is ever increasing, it is recommended that a full-day session of the annual meeting be devoted to the Research Section. The Committee is well aware of the scheduling and planning problems of the Program Committee, and therefore does not feel that it would be fair to ask for a full day of the four-day general meeting. For this reason, it proposes that the annual meeting be lengthened to five days and that a Research Section meeting be held all day on the Sunday which would ordinarily precede the start of the annual meeting of the American Association of Orthodontists. This would then become the first official day of the annual meeting. The Sunday meeting would be held under the auspices of the Research Committee and be conducted in a manner similar to our previous Research Section meetings. A morning and afternoon session would be scheduled, with possibly a group luncheon between the sessions. With careful planning, this would allow ample time for discussion and would permit the reading of research reports from any and all individuals or schools represented at the session. Under this arrangement, the meeting would be open to all members of the Association and they would have an opportunity to hear and discuss the research activities that are going on throughout the country.

To enumerate some of the advantages, it would free one half-day of the meeting for the Program Committee or if, as has occurred in the past, this same time was scheduled as a recreation period, it would permit those attending the Research Section to take part in the recreation activities. A second advantage is that it would permit the scheduling of the reading of the prize essay in a more convenient spot on the program without its being tied down to the Research Section. Third, it would announce to the profession as a whole that the Association is actively fostering, encouraging, and taking part in research activities related to orthodontics. Fourth, it would provide an opportunity for research-minded people to gather together in an unhurried atmosphere for the interchange of knowledge and ideas. Fifth, it would provide an opportunity for members of the Association to get together and meet with those engaged in research, and perhaps give guidance and direction to the paths of future research.

For the above-stated reasons, the Committee recommends to the Board of Directors that the annual meeting be lengthened to five days, and that the Research Section meeting be held all day on the Sunday which would ordinarily precede the annual meeting. It recommends that this change become effective for the New York meeting in 1958, with the details of the method of conducting the first day of the meeting left in the hands of the Research Committee. It further recommends that the prize essay be read as a part of the regular meeting of the Association. It is not the intent of the Committee to separate the Research Section from the regular portion of the annual meeting of the Association, so it is recommended that the first official day of the meeting be designated as the Sunday of the annual meeting.

We wish to take this opportunity to thank the Board of Directors for their very cooperative and helpful attitude in accepting the recommendations of the Research Committee over the past years.

Respectfully submitted,

THOMAS D. SPEIDEL
J. WILLIAM ADAMS
WILLIAM B. DOWNS
HERBERT I. MARGOLIS
ALTON W. MOORE, Chairman.

Department of Orthodontic Abstracts and Reviews

Edited by

DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Abstracts Presented Before the Research Section of the American Association of Orthodontists, New Orleans, May, 1957

A Method of Relating Facial Esthetics to Cephalometric Angular Measurements: By Donald R. Poulton, D.D.S., University of California, School of Dentistry, San Francisco, California.

The highly subjective and personal nature of opinions of facial esthetics makes any study depending on such opinions open to question. Here, the esthetic judgment was obtained by an averaging procedure of ten different opinions in an attempt to arrive at a more objective standard.

Lateral facial photographs of twenty-eight boys and thirty-seven girls 8 to 12 years of age were presented to ten different orthodontists. From their averaged opinions, the ten boys and ten girls with the most acceptable facial esthetics were selected. Similarly, an equal number of the least pleasing faces were chosen. Using this as our standard, certain angles from oriented lateral headfilm tracings of these children, as proposed by various leaders in the orthodontic profession, were recorded and subjected to a statistical test which showed how well a given angle differentiated between the acceptable and unacceptable faces.

Angle measured	SNA	ANB	$\overline{\lvert 1}$ TO MANDIBULAR PLANE	ANGLE OF CONVEXITY	FRANKFORT PLANE—NA	$\overline{\lvert 1}$—FRANKFORT	$\overline{\lvert 1}$—AB
Test result*	2.74	2.85	2.27	3.74	1.33	1.47	1.29

*The Wilcoxin test.

A value of less than 1.00 indicates no significance, while 4.00 would indicate perfect differentiation. If the fact that a given angle shows a marked difference in extremes of facial esthetics is accepted as a criterion of the usefulness of that angle in a cephalometric analysis, these values have the following implications:

1. Angle SNA is preferable to the angle between NA and the Frankfort plane.
2. The angle of convexity (NAPo) is preferable to angle ANB.
3. The relationship of the lower incisor to the mandibular plane is more important to facial esthetics than its relationship to either the Frankfort plane or the AB plane.

A Comparison of the Relation of the Maxillary First Permanent Molar to the Sella Nasion Plane Among Normal, Class II, Division 1, and Class III Cases: By Thomas J. McGovern, B.S., D.D.S., University of Pittsburgh, Pittsburgh, Pennsylvania.

The purpose of this investigation was to determine whether the maxillary first permanent molar assumed a constant relation to the cranium in clinically acceptable normal occlusions and, if so, to note any significant changes in this relation among normal, Class II, Division 1, and Class III cases.

The material for this study was taken from seventy-two cephalograms. Thirty of these roentgenograms were of subjects who presented clinically acceptable normal occlusions, thirty were of Class II, Division 1 cases, and twelve were of Class III cases. The subjects were between 12 and 13 years of age. Only those cases in which both maxillary first permanent molars were present were selected. A Margolis cephalostat was employed for procuring the cephalograms. Tracings were made and both angular and linear relations between the maxillary first permanent molar and cranial landmarks were recorded.

Lines were drawn from various points representing the following anatomic landmarks:

1. S-N, from the center of sella turcica to nasion.
2. S-6, from the center of sella turcica to the point representing the buccal groove of the maxillary first permanent molar.
3. A perpendicular from the sella nasion plane to the point representing the buccal groove of the maxillary first permanent molar.

The angle, N-S-6, formed by these lines was measured with a transparent protractor to within 0.5 degree. The distances (1) along the sella nasion plane, (2) from the center of sella turcica to the descending perpendicular, and (3) along the perpendicular to the point representing the buccal groove of the maxillary first permanent molar were measured with a millimeter ruler to within 0.5 mm.

In the comparison of normal, Class II, Division 1, and Class III cases, no statistically significant differences were found among the angle N-S-6, the horizontal distance along the S-N plane, and the vertical distance from the S-N plane.

A negative correlation was established between the size of angle N-S-6 and the measurement along the S-N plane from the center of sella to the descending perpendicular. No correlation could be established between the size of angle N-S-6 and the distance along the perpendicular from the S-N plane to the point representing the buccal groove of the maxillary first permanent molar.

Coefficients of variation were determined and the linear distance from the center of sella turcica, along the S-N plane, to the point of the descending perpendicular proved to be the greatest variable measured. This was found to be the case in all groups studied.

A Cephalometric Radiographic Study of Maxillary Structures in Unilateral Cleft Palate Children: By Stanley Pastor, D.D.S., M.S.D., Northwestern University Dental School, Chicago, Illinois.

An attempt was made in this study to evaluate growth discrepancies, if present, in unilateral cleft palate children by means of the frontal cephalometric roentgenogram. Twenty-eight subjects between the ages of 12 and 18 years were divided into two groups consisting of fourteen operated unilateral

complete clefts of the lip and palate and fourteen noncleft subjects possessing excellent anatomic occlusion. The Northwestern stereocephalostat was used to take oriented frontal radiographs on all twenty-eight subjects.

Vertical measurements were taken between the superior orbital line (SOL) and the incisal edge of the upper right and left permanent cuspid teeth ($\underline{3}$). Horizontal measurements were taken from the incisal edge of the upper right and left permanent cuspid teeth ($\underline{3}$) to the median orbital line (MOL) and between the most medial point on the curvature of the rim of the orbit (MO) to the median orbital line (MOL). The angulation of the upper right and left permanent cuspids ($\underline{3}$) was obtained by projecting the long axis of the upper cuspid teeth so that it intersected the superior orbital line.

The study was designed so that an analysis of variance could be applied in studying the reliability and validity of collecting and measuring the data.

The data obtained for the horizontal measurement of $\underline{3}$—MOL and the vertical measurement of $\underline{3}$—SOL are significantly different in the area measured between the cleft and noncleft sides for each unilateral cleft patient used in this study. The data obtained for the interorbital distance (MO—MOL) are significantly different between unilateral cleft palate patients and noncleft patients used in this study.

A Radiographic and Nasometric Study of Nasopharyngeal Efficiency in Noncleft Individuals During the Production of Certain Speech Sounds: By Edmond L. Senty, D.D.S., M.S.D., Northwestern University, Chicago, Illinois.

The subjects used in this study consisted of twenty-three noncleft male and female children from the orthodontic and pedodontic clinics of Northwestern University Dental School. They ranged in age from 10 to 14 years and were selected on the basis of acceptable speech quality.

All of the subjects underwent a nasometric evaluation during the phonation of fricative and plosive consonants, as well as the vowels "a," "u," and "i," to determine the relative efficiency of the velopharyngeal structures in controlling nasal emission.

The radiographic portion of this study was done on the stereocephalostat installed in the Cleft Palate Institute, Northwestern University Dental School. Utilization of the stereocephalostat permitted the employment of a high-speed radiographic technique that was essential in obtaining a registration of the velopharyngeal structures on the lateral headfilm during formation of a plosive consonant. In order to study the soft structures in the area of the velopharyngeal valve, a radiopaque disclosing solution was employed to delineate the superior surface of the soft palate and the posterior pharyngeal wall.

Radiographic exposures were made during inhalation, oral blowing, and during phonation of the vowel sounds "a," "u," and "i" and the plosive "pa."

SUMMARY

1. Little significant difference was observed for vertical height of velar closure during phonation of the test sounds "pa," "u," and "i" and oral blowing. Velar height for "a" was distinctly less, although the length of vertical velopharyngeal contact was significantly greater for the plosive consonant "pa" than for the vowel sounds and oral blowing.

2. Significantly greater activity of the posterior pharyngeal wall may have taken place during phonation of the plosive "pa," although statistically it was not evident.

3. The velopharyngeal valve was observed to be open or closed during formation of the vowel sound "a" and the degree of opening extended over a wide range.

4. Control of nasal emission was of more importance to phonation of the plosive and fricative consonants than to vowel formation.

5. A correlation may exist between anterior movement of the posterior pharyngeal wall, the vertical length of velopharyngeal closure, and nasal emission.

A Cephalometric Radiographic Study of the Condylar Movement From Physiologic Rest to Occlusion: By Franklin B. Hines, Jr., B.S., D.D.S., M.S., University of North Carolina School of Dentistry, Chapel Hill, North Carolina.

Twenty-five left and twenty-five right double-exposed profile cephalograms were made of twenty-five subjects with acceptable normal occlusion and facial contour. These cephalograms exhibited the opaque images of carefully positioned lead pellets—two mandibular, two maxillary, and one nasal. The film was first exposed with the mandible in physiologic rest position, and the second with the teeth in centric occlusion. To determine the condylar movement the "triangular transfer method" of Nevakari was used to analyze these cephalograms.

The interpretation of the data obtained by the condylar movement from physiologic rest position to centric occlusion is:

1. The condyle may move in many and various directions. The predominate direction was upward and backward.
2. One hundred per cent of the condyles exhibited either vertical, horizontal, or a combination of vertical and horizontal movement. Therefore, this movement of the condyle should be considered as translatory.
3. The average movement of the condyle was 0.89 mm., which is 48 per cent of the "freeway" space found in the anterior of the mouth.
4. The technique for analyzing the cephalograms had a measuring and reading error of only 0.13 mm.

It is with regret that the JOURNAL reports the recent death of Dr. Ralph Waldron, pioneer orthodontist of Newark, New Jersey.

News and Notes

Central Section of the American Association of Orthodontists

The following is the scientific program for the annual meeting of the Central Section of the American Association of Orthodontists which will be held Sept. 23 and 24, 1957, at the Hotel Nicollet in Minneapolis, Minnesota.

Monday, Sept. 23, 1957

Registration and Purchase of Tickets.

Official Opening of Twentieth Annual Session.
Thomas D. Speidel, President.

Correction of Anterior Open-Bite. A color and sound moving picture of a bilateral ostectomy. Surgery by J. C. Tam. Produced by the Photographic Laboratory, School of Dentistry, University of Minnesota.

The Edgewise Arch Appliance in Theory and Practice.
F. Copeland Shelden, Kansas City, Missouri.

Centric and Excentric Headgear.
Sam Weinstein, Omaha, Nebraska.

Anchorage Consideration in Treatment of Class II, Division 1 Malocclusion.
Howard J. Buchner, Oak Park, Illinois.

Muscles and Mastication.
Robert E. Moyers, Ann Arbor, Michigan.

Twin-Wire Treatment Case Reports.
Howard Yost, Grand Island, Nebraska.

Speech Problems and Orthodontics.
Clark D. Starr, Ph.D., Speech Pathologist, Speech & Hearing Clinic, University of Minnesota.

Tuesday, Sept. 24, 1957

Mandibular Prognathism. A color and sound moving picture of four cases of ostectomy of the mandible. Surgery by Mellor R. Holland. Produced by the Photographic Laboratory, School of Dentistry, University of Minnesota.

The Role of Mechanics in Extraction Cases.
F. Copeland Shelden, Kansas City, Missouri.

The Age and Scope of Orthodontic Treatment.
Earl E. Shepard, St. Louis, Missouri.

Table Clinics.

Great Lakes Society of Orthodontists

The twenty-eighth annual meeting of the Great Lakes Society of Orthodontists will be held at the Hotel Statler, Detroit, Michigan, Oct. 20 through 23, 1957.

Orthodontists and students desiring to attend may make reservations directly through the Hotel Statler. Tickets for social functions may be procured from Dr. James Reynolds, Adrian, Michigan.

H. Irving Miller,
Program Chairman

Middle Atlantic Society of Orthodontists

The next annual meeting of the Middle Atlantic Society of Orthodontists will be held at the Warwick Hotel, Philadelphia, Pennsylvania, Oct. 20 through Oct. 22, 1957.

Northeastern Society of Orthodontists

The fall meeting of the Northeastern Society of Orthodontists will be held at the Hotel Statler, Buffalo, New York, Oct. 21 and 22, 1957.

Pacific Coast Society of Orthodontists*

The Northern Component meets on the second Tuesday of March, June, September, and December.

The Central Component meets on the second Tuesday of March, June, September, and December.

The Southern Component meets on the second Friday of March, June, September, and December.

The twenty-fifth general meeting of the P. C. S. O. will be held Feb. 23 to 27, 1958, in Santa Barbara, California.

Northern Component

No report.

Central Component

The regular quarterly meeting was held on June 11, 1957, at the Fraternity Club, San Francisco, with sixty-seven members and guests in attendance.

The minutes of the March meeting were approved as published in the *Bulletin*.

The highlights of the New Orleans meeting were reported by Ray Curtner at the request of Chairman Hartman. He reported that the amendment to the By-Laws of the A.A.O. regarding preceptorships had passed and that the local constituents would set up regulations governing membership in their particular areas.

The speaker of the evening was Robert Ricketts who discussed "Cephalometric Findings Affecting Contemporary Orthodontic Treatment Planning." The presentation included a discussion of some of the methods now used, as well as his particular use of cephalograms in the evaluation of the patient. As usual, his presentation was well received by the group.

Southern Component

On June 14, Chairman Roscoe Keedy called the meeting to order at 2:30 P.M. at the Huntington-Sheraton Hotel in Pasadena.

Program Chairman John Rathbone introduced Alton W. Moore of the University of Washington. His topic was "Ten Years of Cephalometrics." His marked ability to give a simplified analysis of the fundamentals of cephalometrics was most enlightening and very well received by more than seventy-five orthodontists. His paper was continued in the evening after dinner under the title of "Orthodontic Diagnosis—1957."

Bob Gawley gave a report regarding preceptorships as acted upon at the New Orleans meeting. Alton Moore was called upon to express his opinion with regard to preceptorships and he agreed that they are desirable at this time and stated that the preceptorships will, of necessity, be controlled.

It is with regret that we report the recent death of Dr. C. M. McCauley, father of Dallas McCauley. Dr. McCauley was a member of the Southern Component for over thirty years. He also was head of the Orthodontic Clinic at the Orthopaedic Hospital.

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*Notes from the *Bulletin* of the Pacific Coast Society of Orthodontists.

We have also sustained the loss of Dr. E. M. Johnston, of Riverside, California, a member of a number of years' standing. Our sincerest condolences are extended to the members of both families.

George C. Chuck of Long Beach, California, died suddenly, in his office, of a coronary attack on Jan. 30, 1957.

Rocky Mountain Society of Orthodontists

The annual meeting of the Rocky Mountain Society of Orthodontists will be held Nov. 10 to 13, 1957, at Writers Manor in Denver, Colorado. The program will feature papers by Faustin N. Weber, Memphis, Tennessee; Nathan G. Gaston, Monroe, Louisiana; and Bob Meyer, Denver, Colorado.

Southern Society of Orthodontists

The thirty-sixth annual meeting of the Southern Society of Orthodontists will be held at the Eden Rock Hotel, Miami Beach, Florida, Oct. 27 through Oct. 30, 1957. Reservations may be made by writing direct to the hotel.

Southwestern Society of Orthodontists

The next meeting of the Southwestern Society of Orthodontists will be held Sept. 29 through Oct. 2, 1957, at the Baker Hotel in Dallas, Texas.

American Board of Orthodontics

The next meeting of the American Board of Orthodontics will be held at the Commodore Hotel in New York, New York, April 22 through 26, 1958. Orthodontists who desire to be certified by the Board may obtain application blanks from the Secretary, Dr. Wendell L. Wylie, University of California School of Dentistry, The Medical Center, San Francisco 22, California.

Applications for acceptance at the New York meeting, leading to stipulation of examination requirements for the following year, must be filed before March 1, 1958. To be eligible, an applicant must have been an *active* member of the American Association of Orthodontists for at least two years.

Johnson Alumni Club

The Johnson Alumni Club will hold its next meeting at the Brown Hotel, Louisville, Kentucky, Jan. 26 to 29, 1958.

Washington University School of Dentistry

Washington University School of Dentistry, St. Louis, Missouri, announces a short course in the Johnson twin wire mechanism, which will be given Oct. 7 to 12, 1957.

The course will be given under the direction of Dr. Joseph E. Johnson.

U. S. Department of Health, Education, and Welfare

A new study designed to find ways of providing dental care to aged and chronically ill persons unable to visit dentists' offices was announced today by the Public Health Service. The study will supplement other research currently being supported by the Service in this field.

The study, which is expected to extend over four years, will be conducted in the Kansas City metropolitan area beginning July 1, and will be based on a sample of approximately 1,500 homebound and institutionalized patients. It is expected that data on costs and methods, collected through the study, will help communities in planning programs for many of the chronically ill and aged who do not now receive dental care.

The University of Kansas City School of Dentistry has donated space for the study clinic and Community Services, Incorporated, a nonprofit research agency in Kansas City, is assisting the Division of Dental Public Health, Public Health Service, in the project. Other voluntary and official agencies in the Kansas City metropolitan area will be asked to participate as the study progresses.

Orthodontist Reports on Witchcraft

Dr. Harry B. Wright, orthodontist and explorer of remote parts of the world, has written an interesting book entitled *Witness to Witchcraft* (published by Funk & Wagnalls Company, New York). Dr. Wright is a member of the Explorers' Club and his book tells of his travels in South America, Central Africa, Bali, New Guinea, and other parts of Oceania.

Expeditions to remote places are not new to Dr. Wright. However, he wanted to learn all that he could about witch doctors, who still play an important part in the lives of many of the so-called wild tribes. He relates many interesting "case histories," the first of which was a dental operation performed by a South American witch doctor deep in the jungle.

Any reader interested in some "off the beaten path" experiences will find Dr. Wright's book unusually interesting, not only because of the subjects but because these experiences happened during vacation time away from practice.

Notes of Interest

Ralph E. Braden, D.D.S., announces the association of Bailey W. Prichard, D.D.S., M.S., Plaza Building, 3387 Poplar, Memphis, Tennessee, practice limited to orthodontics.

Dr. Seymour Hoffman announces the opening of his office at 106-15 Queens Blvd., Forest Hills, New York, for the exclusive practice of orthodontics.

Sidney L. Horowitz, D.D.S., announces the removal of his office to 209 Sickles Ave., Nyack, New York, practice limited to orthodontics.

Thomas J. McGovern, D.D.S., M.S., announces the opening of his offices for the practice of orthodontics at 502 First National Bank Bldg., Olean, New York.

John H. McNutt, D.D.S., M.S.D., announces the opening of his office at 1409 San Antonio St., Austin, Texas, practice limited to orthodontics.

H. Harvey Payne, D.D.S., and Robert S. Payne, A.B., D.D.S., announce their association in the practice of orthodontics at 60 Fifth St., N.E., Atlanta, Georgia.

Milton Stern, B.S., D.D.S., announces the removal of his office to 3178 Delaware Ave., Buffalo, New York.

Faustin N. Weber, D.D.S., M.S., announces the association of Herman M. Crowder, D.D.S., M.S., Plaza Building, 3387 Poplar, Memphis, Tennessee, practice limited to orthodontics.

Fayette C. Williams, D.D.S., announces the opening of his office at 503 Williams Bldg., Corinth, Mississippi, practice limited to orthodontics.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and its component societies. The Editorial Board of the JOURNAL is composed of a representative of each of the component societies.

American Association of Orthodontists

President, A. C. Broussard – – – – – – – – Maison Blanche Bldg., New Orleans, La.
President-Elect, Edward C. Martinek – – – – – – – – – Fisher Bldg., Detroit, Mich.
Vice-President, George H. Siersma – – – – – – – – – Republic Bldg., Denver, Colo.
Secretary-Treasurer, Earl E. Shepard – – – – – – – – – 8230 Forsyth, St. Louis, Mo.

Central Section of the American Association of Orthodontists

(Next meeting Sept. 23-24, 1957, Minneapolis)

President, Thomas D. Speidel – – – – – – – – University of Minnesota Dental School, Minneapolis, Minn.
Secretary-Treasurer, William F. Ford – – – – – – – 575 Lincoln Ave., Winnetka, Ill.

Great Lakes Society of Orthodontists

(Next meeting Oct. 20-23, 1957, Detroit)

President, Harlow L. Shehan – – – – – – 601 Jackson City Bank Bldg., Jackson, Mich.
Treasurer, Russell E. Huber – – – – – – – – 350 Fidelity Medical Bldg., Dayton, Ohio
Secretary, D. C. Miller – – – – – – – – – – – 40 South Third St., Columbus, Ohio

Middle Atlantic Society of Orthodontists

(Next meeting Oct. 20-22, 1957, Philadelphia)

President, Aubrey P. Sager – – – – – – – 1210 Medical Arts Bldg., Philadelphia, Pa.
Secretary-Treasurer, Paul A. Deems – – – – – – – – – 835 Park Ave., Baltimore, Md.

Northeastern Society of Orthodontists

(Next meeting Oct. 21-22, 1957, Buffalo)

President, Clifford G. Glaser – – – – – – – – – 1255 Delaware Ave., Buffalo, N. Y.
Secretary-Treasurer, David Mossberg – – – – – – 36 Central Park S., New York, N. Y.

Pacific Coast Society of Orthodontists

(Next meeting Feb. 23-27, 1958, Santa Barbara)

President, A. Frank Heimlich – – – – – – – – 1824 State St., Santa Barbara, Calif.
Secretary-Treasurer, Raymond M. Curtner – – – – – 450 Sutter St., San Francisco, Calif.

Rocky Mountain Society of Orthodontists

(Next meeting Nov. 10-13, 1957, Denver)

President, J. Lyndon Carman – – – – – – – – – 501 Republic Bldg., Denver, Colo.
Secretary-Treasurer, H. Carlyle Pollock, Jr. – – – – – 1558 Humboldt St., Denver, Colo.

Southern Society of Orthodontists

(Next meeting Oct. 27-30, 1957, Miami Beach)

President, Frank P. Bowyer – – – – – – – 608 Medical Arts Bldg., Knoxville, Tenn.
Secretary-Treasurer, H. K. Terry – – – – – – – – 2742 Biscayne Blvd., Miami, Fla.

Southwestern Society of Orthodontists

(Next meeting Sept. 29-Oct. 2, 1957, Dallas)

President, Tom M. Williams – – – – – – – – 612 Medical Arts Bldg., Dallas, Texas
Secretary-Treasurer, Harold S. Born – – – – – – – 908 S. Johnstone, Bartlesville, Okla.

American Board of Orthodontics

President, Lowrie J. Porter – – – – – – – – – – 41 East 57th St., New York, N. Y.
Vice-President, William R. Humphrey – – – – – – – – – Republic Bldg., Denver, Colo.
Secretary, Wendell L. Wylie – – – – – University of California School of Dentistry, The Medical Center, San Francisco, Calif.
Treasurer, Jacob A. Salzmann – – – – – – – – – 654 Madison Ave., New York, N. Y.
Director, L. Bodine Higley – – – – – University of North Carolina, Chapel Hill, N. C.
Director, B. F. Dewel – – – – – – – – – – – – 708 Church St., Evanston, Ill.
Director, Frank P. Bowyer – – – – – – – 608 Medical Arts Bldg., Knoxville, Tenn.

Forthcoming meetings of the American Association of Orthodontists:
1958—Commodore Hotel, New York, New York, April 27 to May 1.
1959—Statler Hotel, Detroit, Michigan, May 4 to 7.
1960—Shoreham Hotel, Washington, D. C., April 24 to 28.
1961—Denver, Colorado.

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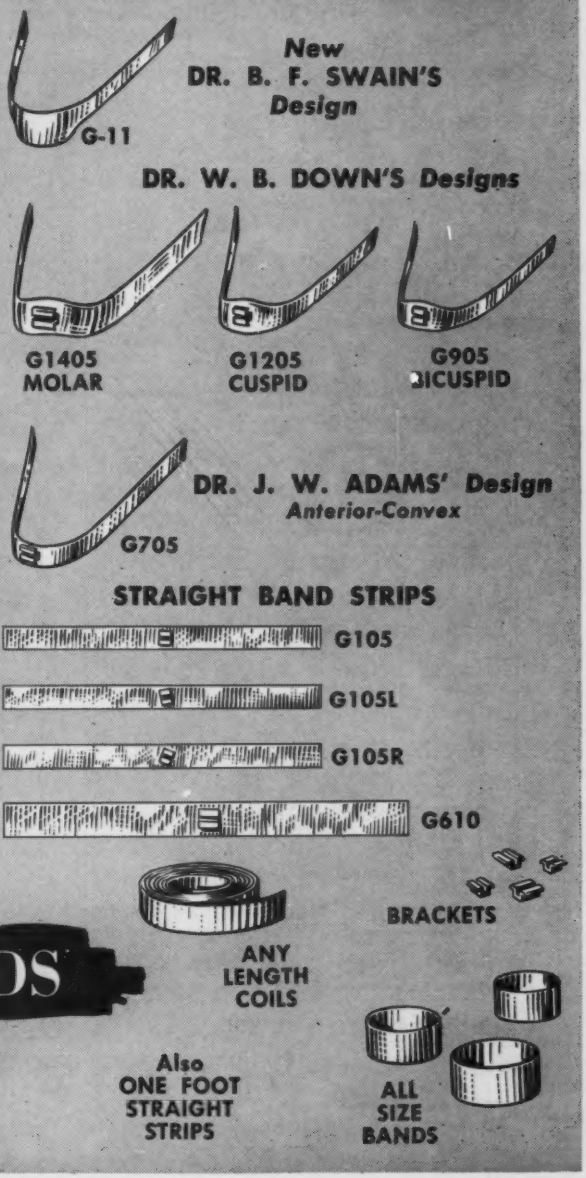

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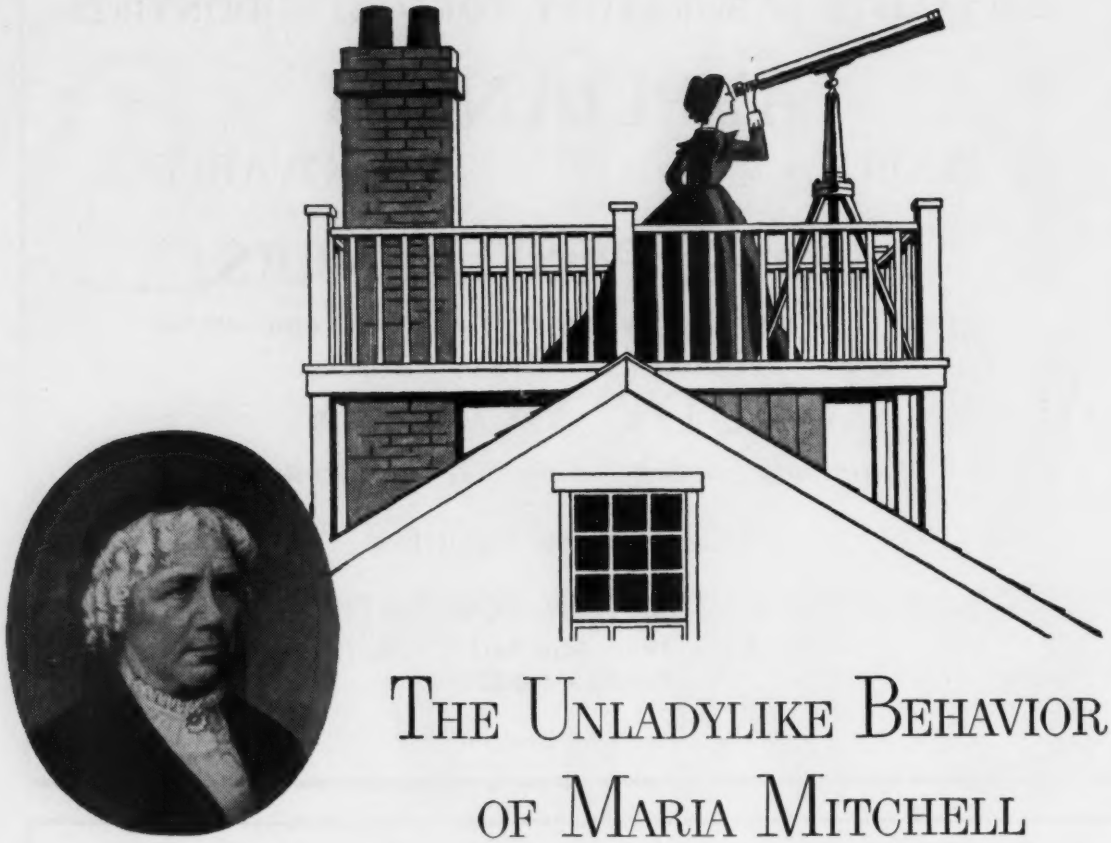

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